TC11/TU56

TC5-TC11 TEST 5
MD-11-DZTCE-D

EP-DZTCE-D-DL-D

FICHE 1 OF 1

DEC 1977
digital
MADE IN USA

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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZTCE-D-D

PRODUCT NAME: TC5-TC11 TEST 5

DATE: AUGUST 1977

MAINTAINER: DIAGNOSTIC ENGINEERING

REVISED BY: PRODUCT ENHANCEMENT

1. ABSTRACT

TCS - TC11 TEST 5 IS PART 5 OF A FIVE PROGRAM PACKAGE USED TO TEST THE TC11 DECTAPE CONTROL. TCS EXERCISES THE TC11 CONTROL AND FROM ONE TO EIGHT SELECTED TRANSPORTS. ALL AVAILABLE CORE STORAGE UP TO 28K IS USED IN ORDER TO EXECUTE THE MAXIMUM NUMBER OF DATA TRANSFERS POSSIBLE.

ALL EXECUTION TIMES QUOTED ARE TYPICAL OF A 11/20 SYSTEM. EXECUTION TIMES IN OTHER PDP-11 SYSTEMS WILL VARY.

2. REQUIREMENTS

2.1 EQUIPMENT

A. PDP-11 SYSTEM (4K CORE).
B. ASR33/35 TELETYPE.
C. TC11 DECTAPE CONTROL AND AT LEAST ONE TU56 DUAL TRANSPORT.
D. ONE STANDARD PDP-11 FORMAT DECTAPE FOR EACH TRANSPORT TO BE TESTED. OF THE TAPE BLOCKS MUST BE ZERO. IF NECESSARY, REFORMAT THE TAPE.

THE TELETYPE AND TC11 CONTROL MUST HAVE THEIR STANDARD PERIPHERAL ADDRESSES, INTERRUPT LEVELS, AND INTERRUPT VECTOR ADDRESSES. REFER TO SECTION 7.2 IF YOUR SYSTEM DOES NOT HAVE STANDARD PERIPHERAL ADDRESSES.

2.2 STORAGE

THIS PROGRAM USES LOCATIONS 000000 THROUGH 010120. ALL REMAINING CORE STORAGE UP TO 28K IS USED FOR DEVICE BUFFER AREAS.

3. LOADING PROCEDURE

THIS PROGRAM'S OBJECT TAPE IS PUNCHED IN ABSOLUTE FORMAT. THE ABS LOADER IS USED TO LOAD THE PROGRAM.

4. USE PROCEDURE

A. LOAD UNITS TO BE TESTED WITH STANDARD FORMAT DECTAPE. SET TO REMOTE/WRITE ENABLE.
B. SET WRTM SWITCH OFF, WALL SWITCH TO OFF.
C. LOAD ADDRESS 000200.
D. PRESS START.
E. THE PROGRAM IDENTIFIES ITSELF, TYPES SETUP INSTRUCTIONS, AND HALTS.
F. PERFORM SETUP (STEPS A AND B), AND SET SR SWITCHES 0 THROUGH 7 TO INDICATE THE UNITS TO BE TESTED. (SR0 FOR UNIT 0, SR1 FOR UNIT 1, ETC .
G. THE PROGRAM TYPES SR OPTIONS MESSAGE. SET DESIRED SR OPTIONS IF ANY. NORMAL SR IS 000000. PRESS CONT.

THIS PROGRAM'S SR OPTIONS ARE:

SR15 = 1 HALT ON ERROR
SR14 = 1 ENTER SCOPE MODE
SR13 = 1 INHIBIT ERROR PRINTOUT
SR11 = 1 INHIBIT ITERATION
SR10 = 1 HALT AT END OF TEST CURRENTLY EXECUTING
SR9 = 1 SELECT THE TEST SPECIFIED BY SR7 THROUGH SR0
SR7 THROUGH SR0 - NUMBER OF TEST TO BE SELECTED

SECTION 7.1 GIVES A COMPLETE EXPLANATION OF SR OPTIONS.

H. THE PROGRAM BEGINS EXECUTION.
I. AT THE END OF EACH PASS THE TELETYPE BELL RINGS ONCE, AND THE CHARACTER "#" IS TYPED.
J. REFER TO SECTION 6.2 IF ERROR PRINTOUTS OCCUR.

EXECUTION TIME:

A. ONE NORMAL ERROR FREE PASS TAKES APPROXIMATELY 1 HOUR.
B. ONE SINGLE ITERATION PASS (SR11=1) TAKES ABOUT 5 MINUTES.

4.1 RESTART PROCEDURE

TO RESTART THE PROGRAM WITHOUT GENERATING THE INITIAL PRINTOUTS PROCEED AS FOLLOWS: (TRANSPORTS UNDER TEST REMAIN THE SAME)

A. LOAD ADDRESS 001000
B. DO UNIT SETUP AS DESCRIBED IN STEPS A AND B OF USE PROCEDURE.
C. SELECT ANY DESIRED OPTIONS.
D. PRESS START.
E. GO TO STEP H OF USE PROCEDURE.

5. PROGRAM AND/OR OPERATOR ACTION

5.1 NORMAL HALTS

LOC 002464 — COMMON HALT. THIS HALT IS CALLED BY THOSE PARTS OF THE PROGRAM THAT REQUIRE THAT THE PROCESSOR STOP. THIS HALT NORMALLY OCCURS UPON COMPLETION OF NON-ERROR PRINTOUTS. THE CONSOLE DATA LIGHTS DISPLAY THE ADDRESS OF INSTRUCTION THAT GENERATED THE HALT REQUEST.

LOC 002016 — ROUTINE END HALT. THIS HALT OCCURS UPON COMPLETION OF THE CURRENT TEST ROUTINE IF SR10 IS SET. THE CONSOLE DATA LIGHTS DISPLAY THE NUMBER OF THE TEST JUST COMPLETED.

5.2 NORMAL PRINTOUTS

ALL NON-ERROR PRINTOUTS ARE NORMAL PRINTOUTS. INSTRUCTION, TITLE, AND USER ERROR PRINTOUTS ARE NORMAL PRINTOUTS.

6. ERRORS

ERRORS ARE REPORTED IN THIS PROGRAM BY THE FOLLOWING METHODS:

A. UNCONDITIONAL ERROR HALTS, OR
B. ERROR PRINTOUT FOLLOWED BY OPTIONAL ERROR HALT.

6.1 UNCONDITIONAL ERROR HALTS

AN UNCONDITIONAL ERROR HALT WILL OCCUR AT THE ADDRESSES LISTED BELOW IF THROUGH HARDWARE OR SOFTWARE FAILURE, PROGRAM CONTROL IS TRANSFERRED TO AN UNEXPECTED AREA BETWEEN 000000 AND 000176.

000002 RESERVED AREA
000006 ERROR TRAP
000012 RESERVED INSTRUCTION TRAP
000016 DEBUG TRAP
000022 IOT TRAP
000026 POWER FAIL TRAP
000040 THROUGH 000176 - SYSTEM SOFTWARE AND INTERRUPT VECTOR AREA, EXCEPT FOR TC11 AND TTY VECTORS.

TO FIND OUT WHERE THE PROGRAM WAS AT THE TIME THE FAILURE OCCURRED.

A. EXAMINE CONTENTS OF REGISTER 6. (ADDRESS 177706).
B. TRANSFER THE CONTENTS OF REG 6 TO THE SR, LOAD ADDRESS AND EXAMINE.
C. THE DATA SHOWN IN THE DATA LIGHTS IS THE VALUE OF THE PC WHEN THE FAILURE OCCURRED.
D. LOCATE IN PROGRAM LISTING THE DISPLAYED PC VALUE.

E. THE INSTRUCTION THAT IMMEDIATELY PRECEDES THE ONE REFERENCED BY THE DISPLAYED PC VALUE IS THE INSTRUCTION THAT WAS/WAS BEING EXECUTED WHEN THE FAILURE OCCURRED.

AN UNCONDITIONAL ERROR HALT FAILURE IS AN ABNORMAL CONDITION INDICATING A HARDWARE FAILURE, OR MOST UNLIKELY, A PROGRAM FAILURE. THIS PROGRAM ASSUMES THAT THE PROCESSOR IS IN OPERATING CONDITION IN ORDER TO PERFORM ITS TESTS.

6.2 ERROR PRINTOUTS

ERROR PRINTOUTS ARE GENERATED BY THE "ERRN" SUBROUTINE. THE "ERRN" SUBROUTINE IS CALLED BY AN "ERRORN" STATEMENT. AN ERROR PRINTOUT LOOKS AS FOLLOWS:

```
T XXX  PC OYYYYY  ICNT ZZZZ.  UNIT W
XFRCNT XXXXXX  WADDR YYYYYY RADDR ZZZZZZ FPC OVVVVV
UP TO 2 ADDITIONAL LINES OF ERROR INFORMATION.
```

WHERE:

T XXX IS THE NUMBER OF FAILING ROUTINE (OCTAL).

PC OYYYYY IS THE ADDRESS OF ERROR CALL.

ICNT ZZZZ. IS THE ITERATION COUNT AT TIME OF FAILURE.

XFRCNT XXXXXX WADDR YYYYYY AND RADDR ZZZZZZ INDICATE THE PARAMETERS IN USE AT TIME OF FAILURE.

FPC OVVVVV IS TYPED WHEN THE ERROR CALL IS GENERATED BY A SUBROUTINE, AND IT IS NECESSARY TO INDICATE WHERE THE SUBROUTINE WAS CALLED FROM.

AFTER THE PRINTOUT IS COMPLETED, THE PROGRAM WILL HALT AT COMMON ERROR HALT AT LOC 002500 IF SR15 IS SET.

WHEN AN ERROR PRINTOUT OCCURS:

A. LOOK UP THE ADDRESS REFERENCED BY PC OYYYYY IN THE LISTING.
B. OPPOSITE THE PC VALUE AN ERRORN STATEMENT WILL BE FOUND, AND IN THE COMMENTS SECTION, A DESCRIPTION OF THE ERROR.
C. AT THE BEGINNING OF THE TEST ROUTINE A DESCRIPTION OF THE TEST WILL BE FOUND.

UP TO 2 LINES OF ADDITIONAL ERROR INFORMATION MAY APPEAR ON AN ERROR PRINTOUT. SOME OF THE ITEMS THAT MAY APPEAR ARE:

A. BLKRQ XXXX. BLKRQ REPRESENTS THE INITIAL BLOCK NUMBER USED WHEN AN OPERATION WAS INITIATED. (IN A 2 OR MORE BLOCK TRANSFER, BLKRQ REPRESENTS THE INITIAL BLOCK NUMBER. EVEN THOUGH A FAILURE MAY NOT HAVE OCCURRED UNTIL A SUBSEQUENT BLOCK.
B. IN A DATA ERROR PRINTOUT THE "WORD #" THAT FAILED REPRESENTS THE POSITION OF THE CORRECT WORD IN THE WRITE BUFFER, AND IT IS NOT MEANT TO DESCRIBE THE WORD'S POSITION IN A DECTAPE BLOCK.

MISCELLANEOUS

SR OPTIONS

THE STANDARD SR OPTIONS ARE DESCRIBED HERE.

SR15 HALT ON ERROR. WITH SR15 SET TO A 1, THE PROGRAM WILL HALT AFTER AN ERROR OCCURS. PRESSING CONT WILL CAUSE PROGRAM TO RESUME OPERATION.

SR14 SCOPE. THIS OPTION CAUSES THE PROGRAM TO REMAIN IN THE CURRENT TEST ROUTINE. WHEN THE OPTION IS REMOVED, THE PROGRAM WILL COMPLETE THE CURRENT ROUTINE, AND WILL THEN GO ON TO THE NEXT ROUTINE.

SR13 INHIBIT ERROR PRINTOUT. THIS OPTION REMOVES ALL ERROR PRINTOUTS.

*****NOTE*****

SCOPE MODE OPERATION IS ACHIEVED BY LOCKING THE PROGRAM IN THE CURRENT ROUTINE, INHIBITING ERROR PRINTOUTS, AND BYPASSING ERROR HALTS.

SR11 INHIBIT ITERATION. SETTING THIS OPTION WILL CAUSE THE PROGRAM TO EXECUTE EACH TEST ONLY ONCE, INSTEAD OF THE NORMAL NUMBER OF ITERATIONS SELECTED FOR EACH TEST. TWO POSSIBLE USES OF THIS OPTION ARE:

A. QUICK PASS, EACH TEST IS RUN ONLY ONCE.
B. TO SKIP OVER A FAILING ROUTINE.

SR10 HALT AT END OF CURRENT ROUTINE. WITH THE OPTION SET, THE PROGRAM WILL HALT AT THE END OF EACH TEST, AND DISPLAY IN DATA LIGHTS THE NUMBER OF THE TEST JUST COMPLETED. THREE POSSIBLE USES OF THIS OPTION ARE:

A. TO STEP THROUGH THE PROGRAM ONE ROUTINE AT A TIME.
B. WHEN THE PROGRAM HAS BEEN RUNNING FOR A WHILE, TO FIND OUT HOW FAR IT HAS PROGRESSED.
C. IN CASE OF A BLOW UP, ETC., TO STEP THROUGH ONE TEST AT A TIME UNTIL THE FAILURE REOCCURS. THE ROUTINE FOLLOWING THE PREVIOUSLY COMPLETED ROUTINE WOULD BE THE FAILING ROUTINE.

SR9 SELECT ROUTINE. WITH SR9 SET, THE PROGRAM WILL GO AND EXECUTE THE ROUTINE INDICATED BY SR7 THROUGH SR0, AFTER THE CURRENT ROUTINE HAS BEEN COMPLETED. IF THE OPTION IS REMOVED, THE PROGRAM WILL PROCEED TO EXECUTE THE ROUTINES FOLLOWING THE SELECTED ROUTINE.

7.2 TESTING TC11 AT NON-STANDARD ADDRESSES AND/OR VECTORS

THIS PROGRAM CAN TEST THE TC11 AT NON-STANDARD ADDRESSES AND VECTORS PROVIDED THOSE ADDRESSES AND VECTORS ARE PROVIDED TO THE PROGRAM AS FOLLOWS:

A. AFTER LOADING PROGRAM REFER TO PROGRAM LISTING AND CHANGE LOCATIONS 001004 THROUGH 001020 TO REFLECT THE NEW TC11 ADDRESSES AND VECTORS.

B. IF THE TELETYPE IS ALSO AT NON STANDARD ADDRESSES, CHANGE LOCATIONS 001022 AND 001024 ALSO.

C. PROCEED TO USE THE PROGRAM, OR

D. USING STANDARD DUMP ROUTINES, DUMP OUT THE ENTIRE PROGRAM IN ABSOLUTE FORMAT TO HAVE AN OBJECT TAPE THAT REFLECTS YOUR SYSTEM, OR

E. DUMP OUT ONLY LOCATIONS 001004 THROUGH 001024 IN ABSOLUTE FORMAT, AND LOAD IT ALSO AFTER LOADING THE MAIN PROGRAM.

8. DESCRIPTION

THIS PROGRAM IS ORGANIZED INTO THREE MAIN SECTIONS:

A. CONTROL ROUTINE,
B. TEST ROUTINES,
C. COMMON SUBROUTINES

8.1 CONTROL ROUTINE

THE CONTROL ROUTINE ASSUMES CONTROL WHEN THE PROGRAM IS STARTED. IT HAS THE FOLLOWING FUNCTIONS:

A. CONTROLS SEQUENCE OF TEST ROUTINES.
B. HONORS AND ACTS ON SR OPTIONS.

THE CONTROL ROUTINE IS CALLED FROM A TEST ROUTINE BY THE "SCOPE" STATEMENT.

8.2 TEST ROUTINES

THE ACTUAL TESTING IS PERFORMED BY A SET OF TEST ROUTINES THAT ARE NUMBERED SEQUENTIALLY FROM 0 TO 10 (OCTAL). EACH TEST ROUTINE IS PRECEDED BY A TEST HEADER THAT IS USED BY THE CONTROL ROUTINE IN ORDER TO PROPERLY SEQUENCE THROUGH THE TESTS. THE HEADER LOOKS AS FOLLOWS: (EXAMPLE)

```
;*****************************************************************
T10:    10              ;ROUTINE NUMBER 10.                      *
        T11             ;ADDRESS OF NEXT ROUTINE                 *
        10.             ;TEST ITERATION COUNT                    *
        BAGA            ;SCOPE ENTRY POINT                       *
;*****************************************************************
```

THE FIRST 2 ITEMS ARE SELF EXPLANATORY. THE TEST ITERATION COUNT INDICATES TO THE CONTROL ROUTINE THE NUMBER OF TIMES THE TEST SHOULD BE PERFORMED BEFORE GOING ON TO THE NEXT ROUTINE.

THE SCOPE ENTRY POINT INDICATES TO THE CONTROL ROUTINE THE ADDRESS IT SHOULD RETURN TO AFTER THE FIRST ITERATION. THE ADDRESS MAY NOT NECCESARILY POINT TO THE FIRST INSTRUCTION OF THE TEST.

8.3 COMMON SUBROUTINES

ALL SUBROUTINES NEEDED BY EITHER THE CONTROL ROUTINE OR TEST ROUTINES ARE GROUPED TOGETHER. THE MOST SIGNIFICANT SUBROUTINE IS THE "ERRN " SUBROUTINE, WHICH IS CALLED BY AN "ERRORN" STATEMENT AND TYPES THE TEST NUMBER AND PC VALUE WHEN A FAILURE OCCURS.

```
                        !
                                        .LIST   SEQ,BIN,ME
                                        .NLIST  MC,MD
                                        .ABS
                                :
000000                                  .=0
000000  000002                        .+2                     ;UNASSIGNED TRAP
000002  000000                        HALT
000004  000006              MACHER:   .+2                     ;SP OVERFLOW, BUS ERROR TRAP
000006  000000                        HALT
000010  000012                        .+2                     ;RESERVED INSTRUCTION TRAP
000012  000000                        HALT
000014  002342              TRCV:     SVSS                    ;TRACE TRAP
                                      PRTY7
000016  000340              IOTV:     RSSS                    ;TRAP TO CALL IOX
                                      PRTY7
000020  000022                        .+2                     ;POWER FAIL TRAP
000022  000340                        HALT
000024  000026              EMTV:     EMTINT                  ;EMT TRAP
                                      PRTY7
000026  000000              TRPV:     DLY                     ;TRAP TRAP. SIMILAR TO EMT
                                      PRTY0
                                ;LOC 40 THROUGH 376 ARE FILLED WITH .+2 AND HALT EXCEPT LOC 46 AND 52.
                                ;EQUATE STATEMENTS
177570                                SR=177570
177776                                PSW=177776
001000                                SPBOT=1000
000240                                NOP=240
000000                                OPEN=0
100000                                MANUAL=BIT15
100000                                BIT15=100000
040000                                BIT14=40000
020000                                BIT13=20000
010000                                BIT12=10000
004000                                BIT11=4000
002000                                BIT10=2000
001000                                BIT9=1000
000400                                BIT8=400
000200                                BIT7=200
000100                                BIT6=100
000040                                BIT5=40
000020                                BIT4=20
000010                                BIT3=10
000004                                BIT2=4
000002                                BIT1=2
000001                                BIT0=1
000000                                R0=%0
000001                                R1=%1
000002                                R2=%2
000003                                R3=%3
000004                                R4=%4
000005                                R5=%5
000006                                R6=%6
000007                                R7=%7
000007                                PC=%7
```

```
442  005746  PUSH=005746
443  024646  PUSH2=024646
444  005726  POPSP=005726
445  022626  POPSP2=022626
446  000340  PRTY7=340
447  000300  PRTY6=300
448  000240  PRTY5=240
449  000200  PRTY4=200
450  000140  PRTY3=140
451  000100  PRTY2=100
452  000040  PRTY1=40
453  000000  PRTY0=0
454  000007  BELL=007
455  177777  TLAST=-1
456  000003  TRC=3
457  000040  I=40
458  177777  X=-1
459  100000  A=BIT15
460  040000  B=BIT14
461  020000  C=BIT13
462  000000  V0=0
463  000004  V1=4
464  000010  V2=10
465  000014  V3=14
466  000020  V4=20
467  000024  V5=24
468  000030  V6=30
469  000034  V7=34
470  020000  MAINT=BIT13
471  010000  DINH=BIT12
472  004000  REV=BIT11
473  000000  FWD=0
474  000000  U0=0
475  000400  U1=BIT8
476  001000  U2=BIT9
477  001400  U3=BIT9!BIT8
478  002000  U4=BIT10
479  002400  U5=BIT10!BIT8
480  003000  U6=BIT10!BIT9
481  003400  U7=BIT10!BIT9!BIT8
482  000100  IE=BIT6
483  000000  SAT=0
484  000002  RNUM=BIT1
485  000004  RDATA=BIT2
486  000006  RALL=BIT2!BIT1
487  000010  SST=BIT3
488  000012  WRTM=BIT3!BIT1
489  000014  WDATA=BIT3!BIT2
490  000016  WALL=BIT3!BIT2!BIT1
491  000001  DO=BIT0
492  000200  UPS=BIT7
493  010000  ILO=BIT12
494  004000  SELE=BIT11
495  000000  EMTX=0
496  000003  SAVSS=3
497  000004  RSTSS=4
```

```
                104400                          DELAY=TRAP
                000046                          .=46
000046          002054                          LOGIC
                000052                          .=52
000052          040000                          40000
                000200                          .=200
000200          000167  001054                  JMP     START           ;GO TO START OF PROGRAM.
                001000                          .=1000
001000          000167  000576                  JMP     GETRDY          ;BYPASS INITIAL PRINTOUTS.
001004          177340                  TCST:   177340                  ;TC11 STATUS REGISTER.
001006          177342                  TCCM:   177342                  ;TC11 COMMAND REGISTER.
001010          177344                  TCWC:   177344                  ;TC11 WORD COUNT REGISTER.
001012          177346                  TCBA:   177346                  ;TC11 BUS ADDRESS REGISTER.
001014          177350                  TCDT:   177350                  ;TC11 DATA REGISTER.
001016          000214                  TCVTR:  214                     ;TC11 INTERRUPT VECTOR
001020          000300                  TCLVL:  PRTY6                   ;TC11 INTERRUPT PRIORITY LEVEL.
001022          177564                  TPS:    177564                  ;LSP CSR
001024          177566                  TPB:    177566                  ;LSP BUFFER
001026          000000                  ICTR:   OPEN                    ;CONTAINS CURRENT ITERATION COUNT
001030          000000                  ICNT:   OPEN                    ;CONTAINS ACCUMULATED ITERATION COUNT.
001032          006062                  KSTART: TO                      ;CONTAINS STARTING ROUTINE ADDR.
001034          000000                  SCOPTR: OPEN                    ;CONTAINS CURRENT SCOPE POINTER.
001036          000000                  RTNNO:  OPEN
001040          000000                  NXTST:  OPEN
001042          000000                  CURTST: OPEN
001044          000000                  CTRA:   OPEN
001046          000000                  TCCMT:  OPEN
001050          000000                  TCSTT:  OPEN
001052          000000                  TCDTT:  OPEN
001054          000000                  TCWCT:  OPEN
001056          000000                  TCBAT:  OPEN
001060          000000                  BLKRQ:  OPEN
001062          000000                  BLKRQS: OPEN
001064          000000                  UNIT:   OPEN
001066          000000                  UNITN:  OPEN
001070          000000                  UNITS:  OPEN
001072          000000                  COMND:  OPEN
001074          000000                  TEMP:   OPEN
001076          000000                  FPC:    OPEN
001100          000000                  RBFLIM: OPEN
001102          000000                  WBFLIM: OPEN
001104          000000                  BFSIZE: OPEN
001106          000000                  XFRCNT: OPEN
001110          000000                  WADDR:  OPEN
001112          000000                  RADDR:  OPEN
001114          000000                  VFBLKN: OPEN
001116          000000                  VRBLKN: OPEN
001120          000005                  ERRLIM: 5
001122                                  EMTTAB:
001122          001730                          .WORD   CHAINN          ;POINTER FOR EMT CALL SCOPE
001124          002436                          .WORD   SRSETT          ;POINTER FOR EMT CALL SRESET
001126          002162                          .WORD   SV03            ;POINTER FOR EMT CALL SAV03
001130          002262                          .WORD   RS03            ;POINTER FOR EMT CALL RST03
001132          002212                          .WORD   SV05            ;POINTER FOR EMT CALL SAV05
001134          002312                          .WORD   RS05            ;POINTER FOR EMT CALL RST05
001136          002202                          .WORD   SV05S           ;POINTER FOR EMT CALL SAV05S
```

```
554  001140  002306                .WORD   BSDSS     ;POINTER FOR EMT CALL BSIOSS
555  001142  002742                .WORD   TYP       ;POINTER FOR EMT CALL TYPE
556  001144  003040                .WORD   TYPS      ;POINTER FOR EMT CALL TYPES
557  001146  002504                .WORD   ERRN      ;POINTER FOR EMT CALL ERRORN
558  001150  003220                .WORD   DACNVV    ;POINTER FOR EMT CALL DACNV
559  001152  003312                .WORD   BDCNVV    ;POINTER FOR EMT CALL BDCNV
560  001154  003560                .WORD   RNGEN     ;POINTER FOR EMT CALL RNDNUM
561  001156  003636                .WORD   INRNDN    ;POINTER FOR EMT CALL INRND
562  001160  003270                .WORD   BMOVV     ;POINTER FOR EMT CALL BMOVE
563  001162  002460                .WORD   CHLT      ;POINTER FOR EMT CALL CHALT
564  001164  002472                .WORD   EHLT      ;POINTER FOR EMT CALL EHALT
565  001166  002416                .WORD   STTCV     ;POINTER FOR EMT CALL SVECTR
566  001170  004354                .WORD   STCOM     ;POINTER FOR EMT CALL SETCOM
567  001172  004314                .WORD   STATS     ;POINTER FOR EMT CALL STATUS
568  001174  004450                .WORD   STPDT     ;POINTER FOR EMT CALL STOPDT
569  001176  004460                .WORD   CKERZ     ;POINTER FOR EMT CALL CKERRZ
570  001200  004524                .WORD   NOINTR    ;POINTER FOR EMT CALL NOINT
571  001202  005160                .WORD   SRCHFF    ;POINTER FOR EMT CALL SRCHF
572  001204  005166                .WORD   SRCHRR    ;POINTER FOR EMT CALL SRCHR
573  001206  005630                .WORD   WDATF     ;POINTER FOR EMT CALL WDATAF
574  001210  005700                .WORD   WDATR     ;POINTER FOR EMT CALL WDATAR
575  001212  005654                .WORD   RDATF     ;POINTER FOR EMT CALL RDATAF
576  001214  005724                .WORD   RDATR     ;POINTER FOR EMT CALL RDATAR
577  001216  005060                .WORD   CWCBA     ;POINTER FOR EMT CALL CKWCBA
578  001220  005006                .WORD   CLEARR    ;POINTER FOR EMT CALL CLEAR
579  001222  005026                .WORD   BINFLL    ;POINTER FOR EMT CALL BINFIL
580  001224  004616                .WORD   DATCK     ;POINTER FOR EMT CALL DATCHK
581  001226  004600                .WORD   DTCKI     ;POINTER FOR EMT CALL DATCKI
582  001230  003122                .WORD   INBINN    ;POINTER FOR EMT CALL INBIN
583  001232  003154                .WORD   GTBIN1    ;POINTER FOR EMT CALL GETBN1
584  001234  003676                .WORD   RNDRVV    ;POINTER FOR EMT CALL RNDRIV
585  001236  003726                .WORD   SELDRR    ;POINTER FOR EMT CALL SELDRV
586  001240  003770                .WORD   RNDXFF    ;POINTER FOR EMT CALL RNDXFR
587  001242  004032                .WORD   XFRSTT    ;POINTER FOR EMT CALL XFRSET
588  001244  004166                .WORD   RNDFBB    ;POINTER FOR EMT CALL RNDFBK
589  001246  004220                .WORD   RNDRBB    ;POINTER FOR EMT CALL RNDRBK
590  001250  004136                .WORD   DRVFLL    ;POINTER FOR EMT CALL DRVFIL
591  001252  004556                .WORD   DTCKSS    ;POINTER FOR EMT CALL DATCKS
592  001254  004262                .WORD   RNDFLL    ;POINTER FOR EMT CALL RNDFIL
593  001256  003654                .WORD   SQDRV     ;POINTER FOR EMT CALL SEQDRV
594
```

```
001260  012706  001000          START   MOV     #SPBOT,R6          ;SET BOTTOM OF SP STACK.
001264  104010                          TYPE                       ;TYPE TITLE.
001266  007145                          PGTIT
001270  004767  002126                  JSR     PC,CORSTP          ;GO ASSIGN BUFFER SPACE.
001274  104043                          INBIN                      ;INIT BINARY COUNT PATTERN.
001276  104016                          INRNO                      ;INIT RANDOM NUMBER GENERATOR.
001300  005737  000042                  TST     @#42               ;PROGRAM LOADED VIA MONITOR?
001304  001524                          BEQ     STRTA              ;BR IF NOT.
                                ;ROUTINE TO DETERMINE TRANSPORTS AVAILABLE FOR TEST.
001306  012767  000402  001376          MOV     #402,ERRNO         ;DISABLE ERROR PRINTOUTS.
001314  112767  000376  177546          MOVB    #376,UNITS         ;ASSUME DRIVES 1-7 AVAILABLE.
001322  012700  000010                  MOV     #8.,R0             ;SET UP TO TEST 8 TIMES.
001326  005267  000010          DTRMN:  INC     SQDRV1
001332  042767  177770  000002          BIC     #177770,SQDRV1
001340  104046                          SELDRV                     ;SELECT A TRANSPORT.
001342  000000                  SQDRV1: OPEN                       ;TRANSPORT #.
001344  000431                          BR      DTRMNA             ;UNIT NOT AVAILABLE RETURN.
001346  104023                          SETCOM                     ;REWIND TO REVERSE END ZONE.
001350  004002                          RNUM+REV
001352  000437                          BR      DTRMNB             ;ERROR RETURN.
001354  005777  177426                  TST     @TCCM              ;WAIT.
001360  100375                          BPL     .-4
001362  005777  177416                  TST     @TCST              ;END ZONE?
001366  100031                          BPL     DTRMNB             ;BR IF NOT.
001370  012777  010210  177414          MOV     #CODEND,@TCBA      ;SET CURRENT ADDR.
001376  012777  177777  177404          MOV     #-1,@TCWC          ;SET WORD COUNT.
001404  104023                          SETCOM                     ;YES. ISSUE WRITE DATA COMMAND.
001406  000015                          WDATA+FWD+DO
001410  000420                          BR      DTRMNB             ;ERROR RETURN.
001412  032777  100200  177366          BIT     #BIT15+BIT7,@TCCM          ;WAIT FOR ERROR/READY.
001420  001774                          BEQ     .-6
001422  005777  177360                  TST     @TCCM              ;ERROR?
001426  100411                          BMI     DTRMNB             ;BR IF YES.
001430  104025                  DTRMNA: STOPDT                     ;STOP DECTAPE.
001432  005300                          DEC     R0                 ;DONE 8 TIMES?
001434  001334                          BNE     DTRMN              ;BR IF NOT.
001436  105767  177426                  TSTB    UNITS              ;ANY UNITS AVAILABLE?
001442  001015                          BNE     DTRMNC             ;BR IF YES.
001444  104010                          TYPE                       ;TYPE NON AVAILABLE MESSAGE.
001446  010125                          NOUNIT
001450  000575                          BR      CHNC               ;GO EXIT.
001452  032777  014000  177324  DTRMNB: BIT     #BIT12+BIT11,@TCST         ;ILO OR SELE ERROR?
001460  001763                          BEQ     DTRMNA             ;BR IF NOT.
001462  016701  177654                  MOV     SQDRV1,R1
001466  146167  003760  177374          BICB    UNTAB(1),UNITS     ;DESELECT NON AVAILABLE TRANSPORT.
001474  000755                          BR      DTRMNA
001476  104010                  DTRMNC: TYPE                       ;TYPE UNITS TO BE TESTED.
001500  010152                          GOOD
001502  012767  000001  000010          MOV     #1,CPENA
001510  012767  000007  177326          MOV     #7,CTRA            ;CHECK UP TO 7 UNITS.
001516  104046                          SELDRV                     ;SELECT DRIVE.
001520  000000                  CPENA:  OPEN                       ;UNIT TO BE SELECTED.
001522  000407                          BR      CPENB              ;UNIT NOT AVAILABLE.
001524  016700  177336                  MOV     UNITN,R0           ;SUCCESS.
001530  116067  010200  006437          MOVB    GTAB(0),GTAPES     ;GET ASCII # FOR GOOD TAPE.
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001536  104010                          TYPE                    ;TYPE # OF UNIT TO TEST.
001540  010175                          GTAPES
001542  005267  177752          CPENB:  INC     CPENA           ;UPDATE TO NEXT DRIVE.
001546  005367  177272                  DEC     CTRA            ;CHECKED ALL DRIVES?
001552  001361                          BNE     CPENA-2         ;BR IF NOT.
001554  000412                          BR      GETRDY          ;YES.
001556  104010                  STRTA:  TYPE                    ;TYPE UNIT SELECT INSTRUCTIONS.
001560  007173                          INST1
001562  104020                          CHALT                   ;WAIT FOR USER.
001564  116767  176000  177276          MOVB    SR,UNITS        ;GET UNITS TO TEST.
001572  001771                          BEQ     STRTA           ;BR IF NO UNITS SELECTED.
001574  104010                          TYPE                    ;TYPE SR OPTION MESSAGE.
001576  007353                          ASETSR
001600  104020                          CHALT                   ;COMMON HALT.
001602    2767  001002  001102  GETRDY: MOV     #1002,ERRNO     ;ENABLE ERROR PRINTOUTS
001610  016767  177216  177222          MOV     KSTART,NXTST    ;ADDR OF 1ST ROUTINE TO NXTST
001616  012767  000340  176152  GTRDYX: MOV     #PRTY7,PSW      ;SET PRIORITY 7.
001624  012706  001000                  MOV     #SPBOT,R6       ;SET BOTTOM OF STACK.
001630  104001                          SRESET                  ;ISSUE RESET.
001632  104022                          SVECTR                  ;PRESET DT INTERRUPT VECTOR TO 0.
001634  000000                          0
001636  005067  177244                  CLR     XFRCNT          ;CLEAR TRANSFER COUNT.
001642  005067  177242                  CLR     WADDR           ;CLEAR WRITE ADDR.
001646  005067  177240                  CLR     RADDR           ;CLEAR READ ADDR.
001652  004767  000216          GTRDYA: JSR     R7,FORWD        ;ROLL FORWARD TO "NEXT" ROUTINE.
001656  032767  001000  175704  GTRDYB: BIT     #BIT9,SR        ;CHECK SELECT ROUTINE SWITCH
001664  001002                          BNE     GTRDYC          ;BRANCH IF SELECT ROUTINE SWITCH IS SET.
001666  000177  177150          GORUN:  JMP     @CURTST         ;GO RUN CURRENT ROUTINE.
001672  016700  175672          GTRDYC: MOV     SR,R0           ;(SR) TO R0
001676  042700  177600                  BIC     #177600,R0      ;MASK UNDESIRED BITS
001702  126700  177130                  CMPB    RTNNO,R0        ;COMPARE RTNNO TO (R0)
001706  001767                          BEQ     GORUN           ;BR IF ROUTINE FOUND.
001710  022767  177777  177122  GTRDYD: CMP     #-1,NXTST       ;NO. CHECK FOR LAST ROUTINE.
001716  001355                          BNE     GTRDYA          ;BRANCH IF NOT LAST ROUTINE.
001720  104010                          TYPE                    ;TYPE INCORRECT RTN SELECTED.
001722  007126                          AINCRT
001724  104020                          CHALT                   ;COMMON HALT.
001726  000725                          BR      GETRDY          ;START OVER.
001730  104025                  CHAINN: STOPDT
001732  012706  001000                  MOV     #SPBOT,R6       ;RESTORE STACK.
001736  005267  177066                  INC     ICNT            ;INCREMENT ITERATION COUNT.
001742  001002                          BNE     CHNAC           ;BR IF RESULT NOT 0.
001744  005167  177060                  COM     ICNT            ;RESULT 0. RESET ICNT TO -1.
001750  032767  040000  175612  CHNAC: BIT     #BIT14,SR       ;CHECK FOR SCOPE OPTION.
001756  001402                          BEQ     CHNA            ;BRANCH IF SCOPE SW NOT SET.
001760  000177  177050          CHNAB: JMP     @SCOPTR         ;RETURN TO ROUTINE.
001764  032767  004000  175576  CHNA:  BIT     #BIT11,SR       ;TEST INHIBIT ITERATION SWITCH
001772  001003                          BNE     CHNAA           ;BRANCH IF INHIBIT ITERATION SW SET.
001774  005367  177026                  DEC     ICTR            ;DECREMENT ITERATION COUNT.
002000  001367                          BNE     CHNAB           ;BRANCH IF COUNT NOT 0.
002002  032767  002000  175560  CHNAA: BIT     #BIT10,SR       ;ROUTINE END HALT SW SET? (SR10)
002010  001403                          BEQ     CHNB            ;BRANCH IF NOT SET.
002012  016700  177020                  MOV     RTNNO,R0        ;TEST # TO R0.
002016  000000                          HALT                    ;ROUTINE END HALT. TEST # IN LIGHTS
002020  032767  001000  175542  CHNB:  BIT     #BIT9,SR        ;CHECK SELECT ROUTINE SWITCH
002026  001265                          BNE     GETRDY          ;BRANCH IF SELECT RTN SW SET
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                                        CMP     #-1,NXTST       ;LAST TEST?
                                        BNE     GTRDYX          ;BRANCH IF NOT LAST TEST.
                                        TYPE                    ;TYPE PROGRAM END BELL.
                                        APGEND
002030  022767  177777  177002           CHNC:   MOV     @#42,R0         ;GET CONTENTS OF 42.
002036  001267                                   BEQ     HERE            ;BR IF 0.
002040  104010                                   RESET                   ;NOT 0, ISSUE RESET.
002042  007453                           LOGIC:  JSR     PC,(0)          ;RETURN TO MONITOR.
002044  000240  000240  000240                   .WORD   NOP,NOP,NOP
002050  105767  177000                           TSTB    UNITS           ;ANY UNITS AVAILABLE FOR TESTING?
002054  001765                                   BEQ     CHNC            ;BR IF NOT.
002056  000643                           HERE:   BR      GETRDY          ;GO REPEAT PROGRAM.
002060  016705  176740                   FORWD:  MOV     NXTST,R5        ;ADDR OF NEXT ROUTINE TO R5.
002064  012567  176732                           MOV     (5)+,RTNNO      ;GET NEXT ROUTINE NUMBER.
002070  012567  176730                           MOV     (5)+,NXTST      ;GET ADDR OF NEXT "NEXT" ROUTINE.
002074  012567  176712                           MOV     (5)+,ICTR       ;GET ITERATION COUNT.
002100  012567  176714                           MOV     (5)+,SCOPTR     ;GET SCOPE LOOP ENTRY POINTER.
002104  010567  176716                   FORWDA: MOV     R5,CURTST       ;ADDR OF NOW CURRENT TEST TO CURTST.
002110  012767  000001  176676                   MOV     #1,ICNT         ;PRESET ICNT TO 1.
002116  016767  176700  175430                   MOV     RTNNO,SR        ;DISPLAY ROUTINE #.
002122  000207                                   RTS     R7              ;EXIT FORWD SUBROUTINE.

                                ;EMT INTERPRETER ROUTINE.
002124  010046                  EMTINT: MOV     R0,-(6)         ;PUSH R0.
002126  016600  000002                   MOV     2(6),R0         ;GET EMT PC.
002132  014000                           MOV     -(0),R0         ;GET EMT CALL.
002134  006300                           ASL     R0              ;TIMES 2.
002136  016000  171122                   MOV     EMTTAB-10000(0),R0      ;FORM EMT ADDR.
002142  000200                           RTS     R0              ;GO TO EMT RTN. RESTORE R0.

                                ;SAVE REGS 0 TO 3 SUBROUTINE.
002144  012666  177766          SV03:   MOV     (6)+,-10.(6)    ;MOVE PC UPSTACK.
002150  012666  177766                   MOV     (6)+,-10.(6)    ;MOVE STATUS UPSTACK.
002154  012767  000002  000046           MOV     #RTI,SV05C
002162  000415                           BR      SV05B

                                ;SUB TO SAVE REGS 0 TO 5 AND PLACE EMT PC IN R5.
002164  012767  000240  000036  SV05S:  MOV     #NOP,SV05C
002172  000403                           BR      SV05A

                                ;SUB TO SAVE REGS 0 TO 5.
002174  012767  000002  000026  SV05:   MOV     #RTI,SV05C
002202  012666  177762          SV05A:  MOV     (6)+,-14.(6)    ;MOVE PC AND PSW UPSTACK.
002206  012666  177762                   MOV     (6)+,-14.(6)
002212  010546                           MOV     R5,-(6)
002214  010446                           MOV     R4,-(6)
002216  010346                  SV05B:   MOV     R3,-(6)
002220  010246                           MOV     R2,-(6)
002222  010146                           MOV     R1,-(6)
002224  010046                           MOV     R0,-(6)
002226  024646                           PUSH2
002230  000002                  SV05C:   RTI                     ;RTI OR NOP.
002232  016605  000020                   MOV     16.(6),R5       ;EMT PC TO R5.
002236  010504                           MOV     R5,R4
002240  005744                           TST     -(4)
002242  000002                           RTI                     ;EXIT.

                                ;RESTORE REGS 0 TO 3 SUBROUTINE.
002244  022626                  RS03:   POPSP2
002246  012600                          MOV     (6)+,R0         ;RESTORE REGS 0 TO 4.
002250  012601                          MOV     (6)+,R1
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                                                MOV     (6)+,R2
                                                MOV     (6)+,R3
002274  016646  177766                          MOV     -10.(6),-(6)    ;MOVE PC AND PSW DOWN STACK.
002300  016646  177766                          MOV     -10.(6),-(6)
002304  000002                                  RTI                     ;EXIT.
                                        ;SUB TO SET R5 IN EMT PC AND RESTORE REGS 0 TOS.
002306  010566  000020                  R5OSS:  MOV     R5,16.(6)       ;SET EMT PC TO R5 CONTENTS.
                                        ;SUB TO RESTORE REGS 0 TO 5.
002312  022626                          R5O5:   POPSP2
002314  012600                                  MOV     (6)+,R0
002316  012601                                  MOV     (6)+,R1
002320  012602                                  MOV     (6)+,R2
002322  012603                                  MOV     (6)+,R3
002324  012604                                  MOV     (6)+,R4
002326  012605                                  MOV     (6)+,R5
002330  016646  177762                          MOV     -14.(6),-(6)    ;MOVE PC AND PSW DOWNSTACK.
002334  016646  177762                          MOV     -14.(6),-(6)
002340  000002                                  RTI                     ;EXIT.
002342  012666  177772                  SV5S:   MOV     (6)+,-6(6)      ;PC AND PSW UPSTACK.
002346  012666  177772                          MOV     (6)+,-6(6)
002352  010546                                  MOV     R5,-(6)         ;SAVE R5.
002354  010446                                  MOV     R4,-(6)         ;SAVE R4.
002356  024646                                  PUSH2
002360  016605  000010                          MOV     8.(6),R5        ;EMT PC TO R5.
002364  010504                                  MOV     R5,R4           ;EMT PC TO R4.
002366  005744                                  TST     -(4)
002370  000002                                  RTI                     ;EXIT EMT SUB.
002372  010566  000010                  R5S5:   MOV     R5,8.(6)        ;R5 TO EMT PC.
002376  022626                                  POPSP2
002400  012604                                  MOV     (6)+,R4         ;RESTORE R4.
002402  012605                                  MOV     (6)+,R5         ;RESTORE R5.
002404  016646  177772                          MOV     -6(6),-(6)
002410  016646  177772                          MOV     -6(6),-(6)
002414  000002                                  RTI                     ;EXIT.
                                        ;ROUTINE TO SET TC11 INTERRUPT VECTOR AND PRIORITY
002416  104006                          STTCV:  SAVOSS
002420  016701  176372                          MOV     TCVTR,R1        ;VECTOR TO R1.
002424  012521                                  MOV     (5)+,(1)+       ;SET DESIRED VECTOR
002426  016721  176366                          MOV     TCLVL,(1)+      ;SET TC11 PRIORITY.
002432  104007                                  R5TOSS
002434  000002                                  RTI
                                        ;ROUTINE TO ISSUE RESET.
002436  010046                          SRSETT: MOV     R0,-(6)         ;PUSH R0.
002440  012700  052525                          MOV     #52525,R0       ;DATA TO R0.
002444  005100                                  COM     R0              ;COMPLEMENT (R0).
002446  010067  177770                          MOV     R0,SRSETT+4     ;(R0) TO SRSETT+4.
002452  000005                                  RESET                   ;ISSUE RESET. (R0) IS
002454  012600                                  MOV     (6)+,R0         ;RESTORE R0.
002456  000002                                  RTI                     ;DISPLAYED. EXIT.
                                        ;COMMON HALT ROUTINE
002460  104006                          CHLT:   SAVOSS
002462  010400                                  MOV     R4,R0           ;DEVELOP ADDR OF CALLER.
002464  000000                                  HALT                    ;HALT CALL ADDR IN DATA LIGHTS.
002466  104007                                  R5TOSS
002470  000002                                  RTI                     ;EXIT.
                                        ;CONDITIONAL ERROR HALT ROUTINE.
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819  002472  005767  175072          EHLT:   TST     SR              ;CHECK FOR HALT ON ERROR.
820  002476  100001                          BPL     EHLTA           ;BRANCH IF NO HALT DESIRED.
821  002500  000000                          HALT                    ;HALT.
822  002502  000002                  EHLTA:  RTI                     ;IN DATA LIGHTS.
823  002504  104025                  ERRN:   STOPDT                  ;ALL STOP.
824  002506  010467  176364                  MOV     R4,FPC          ;CONVERT CALL ADDR OF SUB CALLING.
825  002512  104013                          OACNV
826  002514  001076                          FPC
827  002516  010011                          AFPC
828  002520  000006                          6
829  002522  000003                          SAVSS                   ;SAVE REG 5S
830  002524  010567  000166                  MOV     R5,ERRB         ;DETERMINE CALLING ADDR.
831  002530  162767  000002  000160          SUB     #2,ERRB
832  002536  104013                          OACNV                   ;CONVERT CALLING ADDR TO ASCII.
833  002540  002716                          ERRB
834  002542  007020                          APC
835  002544  000006                          6
836  002546  104013                          OACNV                   ;CONVERT TEST # TO ASCII.
837  002550  001036                          RTNNO
838  002552  007010                          ATNUMB
839  002554  000003                          3
840  002556  104014                          BDCNV                   ;CONVERT ICNT TO DECIMAL ASCII.
841  002560  001030                          ICNT
842  002562  007035                          AICNT
843  002564  000005                          5
844  002566  104013                          OACNV                   ;CONVERT UNIT # TO ASCII.
845  002570  001066                          UNITN
846  002572  007051                          AUNIT
847  002574  000001                          1
848  002576  104013                          OACNV                   ;CONVERT BLKRQ TO ASCII.
849  002600  001060                          BLKRQ
850  002602  007601                          ABLKRQ
851  002604  000006                          6
852  002606  104013                          OACNV                   ;CONVERT TCST TO ASCII.
853  002610  001050                          TCSTT
854  002612  007533                          ATCST
855  002614  000006                          6
856  002616  104013                          OACNV                   ;CONVERT TCCM TO ASCII.
857  002620  001046                          TCCMT
858  002622  007517                          ATCCM
859  002624  000006                          6
860  002626  104013                          OACNV                   ;CONVERT TCWC TO ASCII.
861  002630  001054                          TCWCT
862  002632  007465                          ATCWC
863  002634  000006                          6
864  002636  104013                          OACNV                   ;CONVERT TCBA TO ASCII.
865  002640  001056                          TCBAT
866  002642  007502                          ATCBA
867  002644  000006                          6
868  002646  104013                          OACNV                   ;CONVERT TRANSFER COUNT TO ASCII.
869  002650  001106                          XFRCNT
870  002652  007063                          AXFCNT
871  002654  000006                          6
872  002656  104013                          OACNV                   ;CONVERT WRITE ADDR TO ASCII.
873  002660  001110                          WADDR
874  002662  007101                          AWADDR
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875  002664  000006                          6
876  002666  104013                          OACNV                   ;CONVERT READ ADDR TO ASCII.
877  002670  001112                          RADDR
878  002672  007117                          ARADDR
879  002674  000006                          6
880  002676  012767  007004  000012          MOV     #EMQ,ERRB       ;TYPE ERR HEADER MSG IF NOT INHIBITED.
881  002704  032767  020000  174656  ERRNA:  BIT     #BIT13,SR       ;INHIBIT ERR PRINT?
882  002712  001002                  ERRND:  BNE     ERRNB           ;BR TO INHIBIT.
883  002714  104010                          TYPE                    ;TYPE MSG.
884  002716  000000                  ERRB:   OPEN                    ;DESIRED MSG ADDR GOES HERE.
885  002720  012567  177772          ERRNB:  MOV     (5)+,ERRB       ;GET ADDR OF NEXT MSG.
886  002724  022767  177777  177764          CMP     #-1,ERRB        ;TERMINATOR?
887  002732  001364                          BNE     ERRNA           ;GO TYPE IF NOT TERMINATOR.
888  002734  104021                  ERRNC:  EMALT                   ;END OF MSGS. HALT IF REQUIRED.
889  002736  000004                          RST5S                   ;RESTORE REG 5S.
890  002740  000002                          RTI                     ;EXIT EMT SUB.
891                                  ;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE PRINTER.
892  002742  104006                  TYP:    SAVOSS
893  002744  012500                          MOV     (5)+,R0         ;ADDRESS OF MESSAGE TO R0.
894  002746  112001                  TYPA:   MOVB    (0)+,R1         ;GET CHARACTER
895  002750  001006                          BNE     TYPC            ;BRANCH IF NOT TERMINATOR..
896  002752  112701  000177                 MOVB    #177,R1         ;OUTPUT RUBOUT.
897  002756  004767  000020                 JSR     R7,TYPD
898  002762  104007                          RSTOSS
899  002764  000002                          RTI                     ;TERMINATOR CHAR. DONE. EXIT.
900  002766  122701  000045          TYPC:   CMPB    #45,R1          ;CHECK FOR"%".
901  002772  001411                          BEQ     TYPF            ;BRANCH IF"%"
902  002774  004767  000002                 JSR     R7,TYPD         ;TYPE CHAR IN R1
903  003000  000762                          BR      TYPA
904  003002  110177  176016          TYPD:   MOVB    R1,@TPB         ;OUTPUT CHARACTER TO PRINTER
905  003006  105777  176010                 TSTB    @TPS            ;WAIT FOR DONE FLAG.
906  003012  100375                          BPL     .-4
907  003014  000207                          RTS     R7              ;EXIT
908  003016  112701  000015          TYPF:   MOVB    #15,R1          ;MOVE CARRIAGE RETURN CODE TO R1
909  003022  004767  177754                 JSR     R7,TYPD         ;GO TYPE CHAR.
910  003026  112701  000012          TYPG:   MOVB    #12,R1          ;MOVE LF CODE TO R1.
911  003032  004767  177744                 JSR     R7,TYPD         ;GO TYPE CHAR.
912  003036  000743                          BR      TYPA
913                                  ;SUBROUTINE TO OUTPUT A SERIES OF ASCII MESSAGES ON TELETYPE PRINTER
914  003040  000003                  TYPS:   SAVSS
915  003042  012567  000016                 MOV     (5)+,TYPSB      ;ADDR OF MESSAGE TO TYPSB.
916  003046  022767  177777  000010         CMP     #-1,TYPSB       ;CHECK FOR TERMINATOR
917  003054  001002                          BNE     TYPSA           ;BRANCH IF NOT TERMINATOR.
918  003056  000004                          RSTSS
919  003060  000002                          RTI                     ;TERMINATOR, EXIT
920  003062  104010                  TYPSA:  TYPE                    ;CALL ON TYP SUB TO TYPE MESSAGE
921  003064  000000                  TYPSB:  OPEN                    ;ADDRESS OF MESSAGE GOES HERE
922  003066  000765                          BR      TYPS+2          ;GO PROCESS NEXT MESSAGE
923                                  ;SUBROUTINE TO DELAY.
924          003074                          DLYR0=DLY+4
925          003102                          DLYR1=DLYA+4
926  003070  012727  000310  000000  DLY:    MOV     #200.,#0
927  003076  012727  001750  000000  DLYA:   MOV     #1000.,#0       ;DELAY COUNT TO DLYR1.
928  003104  005367  177772          DLYB:   DEC     DLYR1
929  003110  001375                          BNE     DLYB
930  003112  005367  177756                  DEC     DLYR0
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                                        BNE     DLYA
                                        RTI                             ;EXIT.
                        ;SUBROUTINE TO INITIALIZE BINARY COUNT PATTERNS
                INBINN: MOV     #-1,RIND                ;SET ALL VARIABLES
                        MOV     RIND,PTO
                        MOV     RIND,PTI
                        RTI                             ;EXIT.
                RIND:   OPEN
                PTO:    OPEN
                PTI:    OPEN
                        ;SPECIAL BINARY COUNT PATTERN SUBROUTINE
                GTBIN1: MOV     PTO,PTI                 ;PREVIOUS BIN CHAR TO PT1
                        COM     PT1
                        COM     RIND
                        BNE     .+6
                        INC     PT1
                        MOV     PT1,PTO                 ;SAVE BIN CHAR IN PTO
                        SAV5S
                        MOV     PT1,(5)+                ;
                        RST5S
                        RTI                             ;EXIT.
                        ;EMT SUB TO CONVERT OCTAL TO ASCII.
                OACNVV: SAVOSS                          ;SAVE REGS.
                        MOV     @(5)+,R0                ;GET OCTAL VALUE.
                        MOV     (5)+,R1                 ;GET DESTINATION ADDR.
                        MOV     (5)+,R2                 ;GET CONVERT COUNT.
                        ADD     R2,R1                   ;DEVELOP ADDR TO STORE 1ST CHAR.
                OACNVA: MOV     R0,R3
                        BIC     #177770,R3              ;ISOLATE LEAST SIGNIFICANT DIGIT.
                        ADD     #60,R3                  ;CONVERT DIGIT TO ASCII.
                        MOVB    R3,-(1)                 ;STORE ASCII CHARACTER.
                        BIC     #7,R0
                        ROR     R0
                        ROR     R0
                        ROR     R0
                        DEC     R2                      ;DONE ALL DIGITS?
                        BNE     OACNVA                  ;BRANCH IF NOT DONE.
                        RST5S                           ;RESTORE REGS.
                        RTI                             ;DONE. EXIT.
                        ;EMT SUB TO MOVE VARIABLE NUMBER OF BYTES.
                BMOVV:  SAVOSS                          ;SAVE REGS.
                        MOV     (5)+,R1                 ;GET"FROM"ADDRESS
                        MOV     (5)+,R2                 ;GET"TO"ADDRESS
                        MOV     (5)+,R3                 ;GET COUNT
                BMOVA:  MOVB    (1)+,(2 +               ;MOVE BYTE
                        DEC     R3                      ;DECREMENT COUNT
                        BNE     BMOVA                   ;BRANCH IF NOT DONE.
                        RST5S                           ;RESTORE REGS.
                        RTI                             ;DONE. EXIT.
                        ;EMT SUB TO CONVERT BINARY TO DECIMAL ASCII.
                BDCNVV: SAVOSS                          ;SAVE REGS.
                        MOV     @(5)+,R1                ;GET BINARY VALUE.
                        MOV     #DECVAL,R0              ;ADDR OF DECVAL TO R0.
                        MOV     #TENPWR,R2              ;ADDR OF 10 POWER TO R2.
                        MOV     #5,R3                   ;SET UP FOR 5 CONVERSIONS
                BDCNVA: CLR     R4                      ;CLEAR RESULT.
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 987  003334  161201                  BDCNVB: SUB     (2),R1          ;10 POWER FROM VALUE.
 988  003336  103402                          BCS     BDCNVC          ;BR IF UNSUCCESSFUL.
 989  003340  005204                          INC     R4              ;.1 TO RESULT.
 990  003342  000774                          BR      BDCNVB          ;DO IT AGAIN.
 991  003344  061201                  BDCNVC: ADD     (2),R1          ;RESTORE SUBTRACTED VALUE.
 992  003346  062704  000060                  ADD     #60,R4  ;CONVERT RESULT TO ASCII
 993  003352  110420                          MOVB    R4,(0)+         ;STORE RESULT.
 994  003354  005722                          TST     (2)+            ;UPDATE 10 POWER ADDR.
 995  003356  005303                          DEC     R3              ;DONE 5 TIMES?
 996  003360  001364                          BNE     BDCNVA          ;BR IF NOT.
 997  003362  012501                          MOV     (5)+,R1         ;GET ADDR TO STORE ASCII.
 998  003364  012502                          MOV     (5)+,R2         ;GET # OF DIGITS REQUIRED.
 999  003366  060201                          ADD     R2,R1           ;START WITH LSD.
1000  003370  114041                  BDCNVD: MOVB    -(0),-(1)       ;TRANSFER CHARACTER.
1001  003372  005302                          DEC     R2              ;DONE?
1002  003374  001375                          BNE     BDCNVD          ;BR IF NOT.
1003  003376  104007                          RSTOSS                  ;RESTORE REGS.
1004  003400  000002                          RTI                     ;EXIT.
1005  003402  023420                  TENPWR: 10000.
1006  003404  001750                          1000.
1007  003406  000144                          100.
1008  003410  000012                          10.
1009  003412  000001                          1
1010  003414     040     040     040  DECVAL: .BYTE   040,040,040,040,040,040
1011  003417     040     040     040
1012                                  ;SUBROUTINE TO ASSIGN BUFFER AREAS PER AVAILABLE CORE.
1013  003422  012767  003552  174354  CORSTP: MOV     #CORSTB,MACHER  ;SET UP BUS ERROR TRAP POINTER.
1014  003430  005737  000042                  TST     @#42            ;LOADED  VIA MONITOR?
1015  003434  001407                          BEQ     CORSTF          ;BR IF NOT.
1016  003436  022737  002054  000042          CMP     #LOGIC,@#42     ;42=LOGIC?
1017  003444  001403                          BEQ     CORSTF          ;BR IF YES.
1018  003446  012701  172000                  MOV     #172000,R1      ;172000 TO INITIAL TEST ADDR.
1019  003452  000402                          BR      CORSTA
1020  003454  012701  177500          CORSTF: MOV     #177500,R1      ;177500 TO INITIAL TEST ADDR.
1021  003460  162701  020000          CORSTA: SUB     #20000,R1       ;SUBTRACT 20000 FROM TEST ADDR.
1022  003464  062711  000000                  ADD     #0,(1)          ;REFERENCE TEST ADDR.
1023  003470  012767  000006  174306          MOV     #6,MACHER       ;IF NO TRAP CORE IS AVAILABLE.
1024  003476  010167  175376          CORSTD: MOV     R1,RBFLIM       ;SET READ BUFFER UPPER LIMIT.
1025  003502  162701  010210                  SUB     #CODEND,R1      ;COMPUTE AVAILABLE BUFFER SPACE.
1026  003506  006001                          ROR     R1              ;COMPUTE BUFFER SIZE (READ OR WRITE .
1027  003510  006001                          ROR     R1
1028  003512  042701  000001                  BIC     #BIT0,R1
1029  003516  010167  175362                  MOV     R1,BFSIZE       ;COMPUTED BUFFER SIZE TO BFSIZE.
1030  003522  006301                          ASL     R1
1031  003524  062701  010210                  ADD     #CODEND,R1      ;COMPUTE WRITE BUFFER UPPER LIMIT.
1032  003530  010167  175346                  MOV     R1,WBFLIM       ;AND MOVE TO WBFLIM.
1033  003534  104013                          OACNV                   ;TYPEOUT HIGHEST TEST ADDR.
1034  003536  001100                          RBFLIM
1035  003540  007444                          ACRLIM
1036  003542  000006                          6
1037  003544  104010                          TYPE
1038  003546  007410                          HADRM
1039  003550  000207                          RTS     PC              ;EXIT.
1040  003552  012716  003460          CORSTB: MOV     #CORSTA,(6)     ;SET UP TRAP EXIT.
1041  003556  000002                          RTI                     ;EXIT BUS ERROR TRAP.
1042                                  ;EMT RANDOM NUMBER GENERATOR. NUMBER IS STORED AT LOC AFTER SUB CALL.
```

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1043  003560  104006                  RNGEN:  SAVOSS
1044  003562  016700  000044                  MOV     RP1,R0
1045  003566  006100                          ROL     R0
1046  003570  006100                          ROL     R0
1047  003572  066700  000036                  ADD     RP2,R0
1048  003576  010067  000030                  MOV     R0,RP1
1049  003602  006100                          ROL     R0
1050  003604  006100                          ROL     R0
1051  003606  066700  000022                  ADD     RP2,R0
1052  003612  006100                          ROL     R0
1053  003614  006100                          ROL     R0
1054  003616  010067  000012                  MOV     R0,RP2
1055  003622  016725  000004                  MOV     RP1,(5)+        ;STORE # AT LOC AFTER SUB CALL.
1056  003626  104007                          RSTOSS
1057  003630  000002                          RTI                     ;EXIT.
1058  003632  001233                  RP1:    1233
1059  003634  007622                  RP2:    7622
1060                                  ;EMT SUB TO INITIALIZE RANDOM NUMBER GENERATOR.
1061  003636  012767  001233  177766 INRNDN: MOV     #1233,RP1
1062  003644  012767  007622  177762         MOV     #7622,RP2
1063  003652  000002                          RTI                     ;EXIT.
1064                                  ;EMT SUB TO SELECT SEQUENTIAL DECTAPE UNIT.
1065  003654  005267  000010          SQDRV:  INC     SQDRVA
1066  003660  042767  177770  000002         BIC     #177770,SQDRVA
1067  003666  104046                          SELDRV                  ;SELECT TRANSPORT.
1068  003670  000000                  SQDRVA: OPEN                    ;TRANSPORT NUMBER.
1069  003672  000770                          BR      SQDRV           ;TRANSPORT NOT AVAILABLE RETURN.
1070  003674  000002                          RTI                     ;TRANSPORT SELECTED. EXIT.
1071                                  ;EMT SUB TO SELECT RANDOM DECTAPE UNIT.
1072                                  ;CALL:  RNDRIV
1073  003676  104015                  RNDRVV: RNDNUM                  ;GET RANDOM NUMBER.
1074  003700  000000                  RNDRVA: OPEN                    ;# IS STORED HERE.
1075  003702  042767  177770  177770         BIC     #177770,RNDRVA  ;LIMIT TO 3 LSB.
1076  003710  016767  177764  000002         MOV     RNDRVA,RNDRVB
1077  003716  104046                          SELDRV                  ;SELECT RANDOM UNIT
1078  003720  000000                  RNDRVB: OPEN                    ;NUMBER OF UNIT TO BE SELECTED.
1079  003722  000765                          BR      RNDRVV          ;UNIT NOT AVAILABLE FOR TESTING RETURN.
1080  003724  000002                          RTI                     ;EXIT. UNIT IS SELECTED.
1081                                  ;EMT SUB TO SELECT DECTAPE UNIT SPECIFIED IF AVAILABLE FOR TESTING.
1082                                  ;CALL:  SELDRV  ;CALL SELECT SUBROUTINE.
1083                                  ;       #       ;NUMBER OF UNIT TO BE SELECTED.
1084                                  ;       XXX     ;UNIT NOT AVAILABLE RETURN.
1085                                  ;       NSI     ;RETURN IF UNIT IS SUCCESSFULLY SELECTED.
1086  003726  104006                  SELDRR: SAVOSS
1087  003730  012500                          MOV     (5)+,R0         ;GET NUMBER OF DESIRED UNIT.
1088  003732  136067  003760  175130         BITB    UNTAB(0),UNITS  ;SEE IF UNIT IS TESTABLE.
1089  003740  001405                          BEQ     SELDRA          ;BR IF NOT.
1090  003742  010067  175120                  MOV     R0,UNITN        ;TESTABLE. SAVE UNIT NUMBER.
1091  003746  110067  175113                  MOVB    R0,UNIT+1       ;POSITION UNIT NUMBER FOR LATER IO.
1092  003752  005725                          TST     (5)+
1093  003754  104007                  SELDRA: RSTOSS
1094  003756  000002                          RTI                     ;EXIT.
1095  003760     001     002     004  UNTAB:  .BYTE   BIT0,BIT1,BIT2,BIT3,BIT4,BIT5,BIT6,BIT7
1096  003763     010     020     040
1097  003766     100     200
1098                                  ;EMT SUB TO GENERATE RANDOM TRANSFER COUNT (XFRCNT
```

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1099  003770  104015                        RNDXFF: RNDNUM                  ;GET RANDOM NUMBER.
1100  003772  000000                        RNDXFA: OPEN                    ;NUMBER IS STORED HERE.
1101  003774  042767  000377  177770              BIC     #377,RNDXFA
1102  004002  005767  177764                    TST     RNDXFA             ;NUMBER MUST NOT BE 0.
1103  004006  001770                          BEQ     RNDXFF             ;BR IF ZERO.
1104  004010  026767  177756  175066          CMP     RNDXFA,BFSIZE      ;COMPARE NUMBER AGAINST BUFFER SIZE.
1105  004016  101364                          BHI     RNDXFF             ;IF LARGER, GET ANOTHER NUMBER.
1106  004020  016767  177746  175060          MOV     RNDXFA,XFRCNT      ;NUMBER TO XFRCNT.
1107  004026  104050                          XFRSET                     ;PERFORM BUFFER AND BLOCK SETUP.
1108  004030  000002                          RTI                        ;EXIT.
1109                                  ;EMT SUB TO SET UP BUFFER ADDRESSES AND FWD AND REV BLOCK NUMBERS
1110                                  ;BASED ON VALUE OF TRANSFER COUNT.
1111  004032  016767  175044  175050  XFRSTT: MOV     WBFLIM,WADDR       ;COMPUTE WRITE ADDRESS.
1112  004040  166767  175042  175042          SUB     XFRCNT,WADDR
1113  004046  166767  175034  175034          SUB     XFRCNT,WADDR
1114  004054  016767  175020  175030          MOV     RBFLIM,RADDR       ;COMPUTE READ ADDRESS.
1115  004062  166767  175020  175022          SUB     XFRCNT,RADDR
1116  004070  166767  175012  175014          SUB     XFRCNT,RADDR
1117  004076  016767  175004  175012          MOV     XFRCNT,VRBLKN      ;COMPUTE NUMBER OF BLOCKS REQUIRED,
1118  004104  105067  175006                  CLRB    VRBLKN             ;AND FWD MAX AND REV MIN BLOCK NUMBERS
1119  004110  000367  175002                  SWAB    VRBLKN             ;
1120  004114  012767  001102  174772          MOV     #1102,VFBLKN
1121  004122  166767  174770  174764          SUB     VRBLKN,VFBLKN      ;MAX FWD BLOCK.
1122  004130  005367  174762                  DEC     VRBLKN             ;MIN REV BLOCK.
1123  004134  000002                          RTI                        ;EXIT.
1124                                  ;EMT SUB TO FILL WRITE BUFFER WITH NUMBER OF DRIVE UNDER TEST.
1125  004136  104006                  DRVFLL: SAVOSS
1126  004140  016700  174744                  MOV     WADDR,R0
1127  004144  016701  174716                  MOV     UNITN,R1
1128  004150  016703  174732                  MOV     XFRCNT,R3
1129  004154  010120                  DRVFLA: MOV     R1,(0)+
1130  004156  005303                          DEC     R3
1131  004160  001375                          BNE     DRVFLA
1132  004162  104007                          RSTOSS
1133  004164  000002                          RTI                        ;EXIT.
1134                                  ;EMT SUB TO SELECT RANDOM FORWARD BLOCK NUMBER.
1135  004166  104015                  RNDFBB: RNDNUM                     ;GET RANDOM NUMBER.
1136  004170  000000                  RDFBBA: OPEN                       ;NUMBER IS STORED HERE.
1137  004172  026767  177772  174714          CMP     RDFBBA,VFBLKN      ;NUMBER MUST NOT BE LARGER THAN VFBLKN.
1138  004200  101372                          BHI     RNDFBB             ;BR IF LARGER. GET ANOTHER NUMBER.
1139  004202  016767  177762  174650          MOV     RDFBBA,BLKRQ       ;NEW BLOCK NUMBER TO BLKRQ.
1140  004210  016767  174644  174644          MOV     BLKRQ,BLKRQS
1141  004216  000002                          RTI                        ;EXIT.
1142                                  ;EMT SUB TO SELECT RANDOM REVERSE BLOCK NUMBER.
1143  004220  104015                  RNDRBB: RNDNUM                     ;GET RANDOM NUMBER.
1144  004222  000000                  RDRBBA: OPEN                       ;NUMBER IS STORED HERE.
1145  004224  026767  174666  177770          CMP     VRBLKN,RDRBBA      ;NUMBER MUST NOT BE SMALLER THAN VRBLKN.
1146  004232  101372                          BHI     RNDRBB             ;BR IF SMALLER. GET ANOTHER NUMBER.
1147  004234  026727  177762  001101          CMP     RDRBBA,#1101       ;NUMBER MUST NOT EXCEED 1101.
1148  004242  101366                          BHI     RNDRBB             ;BR IF LARGER.
1149  004244  016767  177752  174606          MOV     RDRBBA,BLKRQ       ;NEW BLOCK NUMBER TO BLKRQ.
1150  004252  016767  174602  174602          MOV     BLKRQ,BLKRQS
1151  004260  000002                          RTI                        ;EXIT.
1152                                  ;EMT SUB TO FILL WRITE BUFFER WITH RANDOM DATA.
1153  004262  104006                  RNDFLL: SAVOSS
1154  004264  016700  174620                  MOV     WADDR,R0           ;GET STARTING ADDR.
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1155  004270  016701  174612              MOV     XFRCNT,R1           ;GET COUNT.
1156  004274  104015              RNDFLA: RNDNUM                      ;GET RANDOM NUMBER.
1157  004276  000000              RNDFLB: OPEN                        ;NUMBER IS STORED HERE.
1158  004300  016720  177772              MOV     RNDFLB,(0)+         ;STORE NUMBER WHERE.
1159  004304  005301                      DEC     R1                  ;DONE?
1160  004306  001372                      BNE     RNDFLA              ;BR IF NOT DONE.
1161  004310  104007                      RSTOSS
1162  004312  000002                      RTI                         ;EXIT.
1163                              ;EMT SUB TO SAVE TCCM, TCST, TCDT, TCWC, TCBA.
1164  004314  017767  174464  174526 STATS:  MOV     @TCST,TCSTT         ;SAVE TCST.
1165  004322  017767  174460  174516        MOV     @TCCM,TCCMT         ;SAVE TCCM.
1166  004330  017767  174454  174516        MOV     @TCWC,TCWCT         ;SAVE TCWC.
1167  004336  017767  174452  174506        MOV     @TCDT,TCDTT         ;SAVE TCDT.
1168  004344  017767  174442  174504        MOV     @TCBA,TCBAT         ;SAVE TCBA.
1169  004352  000002                      RTI                         ;EXIT EMT SUB.
1170                              ;EMT SUB TO ISSUE DT COMMAND SPECIFIED AT CALL+2.
1171  004354  005067  174512     STCOM:  CLR     COMND               ;CLEAR PREVIOUS COMMAND
1172  004360  016767  174500  174504        MOV     UNIT,COMND          ;UNIT # TO COMND.
1173  004366  057667  000000  174476        BIS     @(6),COMND          ;SET DESIRED COMMAND IN COMND.
1174  004374  016777  174472  174404        MOV     COMND,@TCCM         ;ISSUE COMMAND.
1175  004402  032777  100200  174376        BIT     #BIT15!BIT7,@TCCM       ;READY AND ERROR BIT CLEAR?
1176  004410  001414                      BEQ     STCOMB              ;BR IF YES.
1177  004412  032767  000001  174452        BIT     #BIT0,COMND         ;WAS THE DO BIT SET IN COMND?
1178  004420  001410                      BEQ     STCOMB              ;BR IF NOT.
1179  004422  000003                      SAVSS
1180  004424  104024                      STATUS                      ;SAVE STATUS.
1181  004426  104012                      ERRORN                      ;ERROR. DO BIT FAILED TO CAUSE CLEARING
1182  004430  010003                      FPCMSG
1183  004432  007735                      STCMSG                      ;OF READY AND/OR ERROR BIT(S). OR I.O.
1184  004434  007511                      STAT                        ;BLOCK MISS, OR DATA MISS ERROR OCCURRED.
1185  004436  177777                      -1
1186  004440  104000                      SCOPE
1187  004442  062716  000002     STCOMB: ADD     #2,(6)              ;SET UP RETURN.
1188  004446  000002                      RTI                         ;EXIT STCOM SUB.
1189                              ;EMT SUB TO STOP ALL DECTAPES.
1190  004450  042777  000116  174330 STPDT:  BIC     #116,@TCCM          ;ISSUE SAT COMMAND.
1191  004456  000002                      RTI                         ;EXIT EMT SUB.
1192                              ;EMT SUB TO CHECK FOR DECTAPE ERROR OR END ZONE.
1193  004460  000003              CKERZ:  SAVSS
1194  004462  005777  174320              TST     @TCCM               ;ERROR BIT SET?
1195  004466  100404                      BMI     CKERZC              ;BR IF YES.
1196  004470  005725                      TST     (5)+                ;NO. SET UP OK EXIT.
1197  004472  005725              CKERZA: TST     (5)+
1198  004474  000004              CKERZB: RSTSS
1199  004476  000002                      RTI                         ;EXIT EMT SUB.
1200  004500  005777  174300     CKERZC: TST     @TCST               ;END OF ZONE BIT SET?
1201  004504  100772                      BMI     CKERZA              ;BR IF YES.
1202  004506  104024              CKERZD: STATUS
1203  004510  104012                      ERRORN                      ;DECTAPE ERROR.
1204  004512  010003                      FPCMSG
1205  004514  007561                      DTERR
1206  004516  007511                      STAT
1207  004520  177777                      -1
1208  004522  000764                      BR      CKERZB
1209                              ;EMT SUB TO HANDLE FAILURE TO INTERRUPT.
1210  004524  000003              NOINTR: SAVSS
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1211  004526  104024                          STATUS                  ;SAVE STATUS.
1212  004530  104012                          ERRORN                  ;DECTAPE FAIL TO INTERRUPT.
1213  004532  010003                          FPCMSG
1214  004534  007542                          INTFAI
1215  004536  007511                          STAT
1216  004540  177777                          -1
1217  004542  000004                          RST5S
1218  004544  000002                          RTI                     ;EXIT EMT SUB.
1219                          ;EMT SUB TO CHECK EXPECTED DATA AGAINST ACTUAL DATA AND REPORT ERRORS.
1220  004546  000000          DATIND: OPEN
1221  004550  000000          DATKNT: OPEN                            ;CURRENT WORD NUMBER.
1222  004552  000000          EXPDAT: OPEN
1223  004554  000000          ACTDAT: OPEN
1224  004556  012767  001066  174324  DTCKSS: MOV     #UNITN,WADDR    ;UNIT NUMBER ADDR TO WADDR.
1225  004564  012767  021021  000202          MOV     #021021,DATCKE  ;PREVENT INCREMENT OF S/B ADDR.
1226  004572  005067  177750                  CLR     DATIND
1227  004576  000414                          BR      DATCKK
1228  004600  012767  022041  000166  DTCKI:  MOV     #022041,DATCKE  ;INDICATE DECREMENT OF ACT DATA.
1229  004606  012767  177777  177732          MOV     #-1,DATIND
1230  004614  000405                          BR      DATCKK
1231  004616  012767  022021  000150  DATCK:  MOV     #022021,DATCKE  ;INDICATE INCREMENT OF ACT DATA.
1232  004624  005067  177716                  CLR     DATIND
1233  004630  104006          DATCKK: SAVOSS
1234  004632  016700  174252                  MOV     WADDR,R0        ;GET EXP DATA ADDR.
1235  004636  016701  174250                  MOV     RADDR,R1        ;GET ACT DATA ADDR.
1236  004642  005767  177700                  TST     DATIND          ;CHECK FOR ACT DATA DECREMENT.
1237  004646  001406                          BEQ     DATCKA          ;BR IF NO DECREMENT REQUIRED.
1238  004650  066701  174232                  ADD     XFRCNT,R1       ;YES. COMPUTE UPPER LIMIT OF ACT DATA.
1239  004654  066701  174226                  ADD     XFRCNT,R1
1240  004660  162701  000002                  SUB     #2,R1
1241  004664  016702  174216  DATCKA: MOV     XFRCNT,R2               ;GET # OF WORDS TO CHECK.
1242  004670  012767  000001  177652          MOV     #1,DATKNT       ;SET CURRENT WORD # TO 1.
1243  004676  016703  174216                  MOV     ERRLIM,R3       ;ERR LIMIT TO ERROR COUNTER.
1244  004702  011067  177644  DATCKB: MOV     (0),EXPDAT              ;GET EXP DATA WORD.
1245  004706  011167  177642                  MOV     (1),ACTDAT      ;GET ACT DATA WORD.
1246  004712  026767  177634  177634  DATCKC: CMP     EXPDAT,ACTDAT   ;COMPARE ACT DATA AND EXP DATA.
1247  004720  001423                          BEQ     DATCKD          ;BR IF NOT SAME.
1248  004722  104014                          BDCNV                   ;DATA NOT SAME. CONVERT WORD # TO DECIMAL ASCII.
1249  004724  004550                          DATKNT
1250  004726  007677                          AWDCNT
1251  004730  000004                          4
1252  004732  104013                          OACNV                   ;CONVERT EXP DATA TO ASCII.
1253  004734  004552                          EXPDAT
1254  004736  007712                          ADATSB
1255  004740  000006                          6
1256  004742  104013                          OACNV                   ;CONVERT ACT DATA TO ASCII.
1257  004744  004554                          ACTDAT
1258  004746  007726                          ADATWS
1259  004750  000006                          6
1260  004752  104012                          ERRORN                  ;TYPE DATA ERROR MESSAGE.
1261  004754  010003                          FPCMSG
1262  004756  007572                          BLKSB
1263  004760  007657                          DATERR
1264  004762  177777                          -1
1265  004764  005303                  DEC     R3                      ;NTH ERROR?
1266  004766  001405                  BEQ     DATCKH                  ;BR IF YES.
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1267  004770  005267  177554          DATCKD: INC     DATKNT          ;INCREMENT WORD #
1268  004774  000000                  DATCKE: OPEN
1269  004776  005302                  DATCKG: DEC     R2              ;DONE CHECKING?
1270  005000  001340                          BNE     DATCKB          ;BR IF NOT.
1271  005002  104007                  DATCKH: RSTOSS                  ;DONE.
1272  005004  000002                          RTI                     ;EXIT.
1273                                  ;EMT SUB TO CLEAR SPECIFIED AREA TO 0'S.
1274  005006  104006                  CLEARR: SAVOSS
1275  005010  012500                          MOV     (5)+,R0         ;GET STARTING ADDR.
1276  005012  012501                          MOV     (5)+,R1         ;GET COUNT.
1277  005014  005020                          CLR     (0)+            ;CLEAR WORD.
1278  005016  005301                          DEC     R1              ;DONE?
1279  005020  001375                          BNE     .-4             ;BR IF NOT DONE.
1280  005022  104007                          RSTOSS                  ;DONE
1281  005024  000002                          RTI                     ;EXIT.
1282                                  ;EMT SUB TO FILL AREA WITH BINARY COUNT PATTERN.
1283  005026  104006                  BINFLL: SAVOSS
1284  005030  016700  174054                  MOV     WADDR,R0        ;GET STARTING ADDR.
1285  005034  016701  174046                  MOV     XFRCNT,R1       ;GET COUNT.
1286  005040  104044                  BINFLA: GETBN1                  ;GET BINARY WORD.
1287  005042  000000                  BINFLB: OPEN                    ;BINARY WORD IS STORED HERE.
1288  005044  016720  177772                  MOV     BINFLB,(0)+     ;STORE WORD.
1289  005050  005301                          DEC     R1              ;DONE?
1290  005052  001372                          BNE     BINFLA          ;BR IF NOT DONE.
1291  005054  104007                          RSTOSS                  ;DONE.
1292  005056  000002                          RTI                     ;EXIT.
1293                                  ;EMT SUB TO CHECK THAT WORD COUNT IS 0, AND THAT TCBA CONTENTS
1294                                  ;MATCH THE EXPECTED CONTENTS.
1295  005060  000003                  CWCBA:  SAV5S
1296  005062  012567  174006                  MOV     (5)+,TEMP       ;GET EXPECTED TCBA CONTENTS.
1297  005066  104024                          STATUS                  ;SAVE TCWC AND TCBA.
1298  005070  005777  173714                  TST     @TCWC           ;WORD COUNT 0?
1299  005074  001407                          BEQ     CWCBB           ;BR IF 0 (OK).
1300  005076  104C12                          ERRORN                  ;WORD COUNT NOT 0. TYPE
1301  005100  010003                          FPCMSG                  ;CONTENTS OF TCWC AND TCBA.
1302  005102  007610                          WCNOTO
1303  005104  007457                          CTCWC
1304  005106  007474                          CTCBA
1305  005110  177777                          -1
1306  005112  104000                          SCOPE
1307  005114  026777  173754  173670  CWCBB:  CMP     TEMP,@TCBA      ;TCBA AND EXPECTED TCBA SAME?
1308  005122  001414                          BEQ     CWCBC           ;BR IF YES (OK).
1309  005124  104013                          OACNV                   ;NO. CONVERT EXPECTED TCBA TO ASCII.
1310  005126  001074                          TEMP
1311  005130  007646                          ATCBAS
1312  005132  000006                          6
1313  005134  104012                          ERRORN                  ;TCBA DOES NOT MATCH EXPECTED
1314  005136  010003                          FPCMSG                  ;TCBA CONTENTS. TYPE EXPECTED TCBA,
1315  005140  007624                          INCTCB                  ;ACTUAL TCBA, AND TCWC.
1316  005142  007640                          TCBASB
1317  005144  007474                          CTCBA
1318  005146  007457                          CTCWC
1319  005150  177777                          -1
1320  005152  104000                          SCOPE
1321  005154  000004                  CWCBC:  RST5S
1322  005156  000002                          RTI                     ;EXIT.
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                                                ;EMT SUBS TO SEARCH FOR DESIRED BLOCK NUMBER. SRCHFF GETS FORWARD
                                                ;BLOCK NUMBERS. SRCHRR GETS REVERSE BLOCK NUMBERS.
005160  105067  000321            SRCHFF: CLRB    DIRIND          ;SET FORWARD INDICATOR.
005164  000403                            BR      SRCHA
005166  112767  177777  000311    SRCHRR: MOVB    #-1,DIRIND      ;SET REVERSE INDICATOR.
005174  012777  005260  173614    SRCHA:  MOV     #SRCHC,@TCVTR   ;SET INTERRUPT VECTOR TO SRCHC.
005202  112767  000005  000374            MOVB    #5,REVCNT       ;SET MAX # OF REVERSALS ALLOWED.
005210  052767  004000  000020            BIS     #REV,SRCHM      ;SET REV BIT IN SRCHM.
005216  032777  004000  173562            BIT     #REV,@TCCM      ;REV BIT SET IN TCCM?
005224  001003                            BNE     SRCHAA          ;BR IF YES.
005226  042767  004000  000002            BIC     #REV,SRCHM      ;NO. CLEAR REV BIT FROM SRCHM.
005234  104023                    SRCHAA: SETCOM                  ;START SEARCH.
005236  000103                    SRCHM:  RNUM!IE!DO
005240  000402                            BR      SRCHB
005242  005277  173540            SRCCON: INC     @TCCM           ;ISSUE DO TO ENABLE RNUM.
005246  104400                    SRCHB:  DELAY                   ;TIME OUT INTERRUPT.
005250  104400                            DELAY
005252  104400                            DELAY
005254  104027                            NOINT                   ;FAILURE TO INTERRUPT.
005256  104000                            SCOPE
005260  012716  005266            SRCHC:  MOV     #SRCHD,(6)      ;HERE WHEN INTERRUPT OCCURS.
005264  000002                            RTI                     ;EXIT TO SRCHD.
005266  022626                    SRCHD:  POPSP2                  ;RESTORE STACK.
005270  005777  173512                    TST     @TCCM           ;ERROR BIT SET?
005274  100003                            BPL     SRCHDA          ;BR IF NOT.
005276  104026                            CKERRZ                  ;CHECK FOR ERROR/ENDZ.
005300  104000                            SCOPE                   ;ERROR RETURN, SCOPE.
005302  000451                            BR      SRCREV          ;ENDZ, GO REVERSE DIRECTION.
005304  027767  173504  173546    SRCHDA: CMP     @TCDT,BLKRQ     ;COMPARE BLK# IN TCDT TO REQUIRED BLK#.
005312  001431                            BEQ     SRCF            ;BR IF BLK FOUND.
005314  003014                            BGT     SRCHE           ;BR IF TCDT HIGH.
005316  032777  004000  173462            BIT     #BIT11,@TCCM    ;TCDT LOW. CHECK DIRECTION.
005324  001746                            BEQ     SRCCON          ;BR IF GOING FWD. CONTINUE SAME DIRECTION.
005326  062777  000003  173460            ADD     #3,@TCDT        ;ADD 3 TO TCDT.
005334  027767  173454  173516            CMP     @TCDT,BLKRQ     ;LOWER BY 3 OR MORE?
005342  101435                            BLOS    SRCRVA          ;GO REVERSE IF LOWER BY 3 OR MORE.
005344  000736                            BR      SRCCON          ;NOT LOW ENOUGH. CONTINUE SAME DIRECTION.
005346  032777  004000  173432    SRCHE:  BIT     #BIT11,@TCCM    ;TCDT HIGH. CHECK DIRECTION.
005354  001332                            BNE     SRCCON          ;BR IF IN REVERSE. CONTINUE DIRECTION.
005356  162777  000003  173430            SUB     #3,@TCDT        ;SUBTRACT 3 FROM TCDT.
005364  026777  173470  173422            CMP     BLKRQ,@TCDT     ;HIGHER BY 3 OR MORE?
005372  003425                            BLE     SRCRVB          ;GO REVERSE IF HIGHER BY 3 OR MORE.
005374  000722                            BR      SRCCON          ;NOT HIGH ENOUGH. CONTINUE DIRECTION.
005376  032777  004000  173402    SRCF:   BIT     #BIT11,@TCCM    ;TCDT EQUAL. CHECK DIRECTION.
005404  001004                            BNE     SRCHG           ;BR IF IN REVERSE.
005406  105767  000073                    TSTB    DIRIND          ;GOING FORWARD. FWD BLK# WANTED?
005412  001313                            BNE     SRCCON          ;BR IF FWD BLK# NOT WANTED.
005414  000002                            RTI                     ;EXIT EMT SUB.
005416  105767  000063            SRCHG:  TSTB    DIRIND          ;GOING REV. REV BLK# WANTED?
005422  001707                            BEQ     SRCCON          ;BR IF REV BLK# NOT WANTED.
005424  000002                            RTI                     ;REV BLK# WANTED. EXIT.
005426  032777  004000  173352    SRCREV: BIT     #BIT11,@TCCM    ;REV BIT SET?
005434  001404                            BEQ     SRCRVB          ;BR IF NOT.
005436  042777  004000  173342    SRCRVA: BIC     #BIT11,@TCCM    ;IN REVERSE. SET TO FORWARD.
005444  000403                            BR      SRCRVC
005446  052777  004000  173332    SRCRVB: BIS     #BIT11,@TCCM    ;FORWARD. SET TO REVERSE.
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005454  105367  000024           SRCRVC: DECB    REVCNT          ;FIFTH REVERSAL ISSUED?
005460  001270                           BNE     SRCCON          ;BR IF NOT.
005462  104024                           STATUS                  ;YES. ERROR. SAVE STATUS.
005464  000003                           SAVSS
005466  104012                           ERRORN                  ;BLK# NOT FOUND WITHIN 5 TAPE
005470  010003                           FPCMSG                  ;REVERSALS.
005472  007572                           BLKSB
005474  007764                           SRCHER
005476  007511                           STAT
005500  177777                           -1
005502  104000                           SCOPE
005504     000                   REVCNT: .BYTE   OPEN
005505     000                   DIRIND: .BYTE   OPEN
                                 ;EMT SUBS TO WDATA, RDATA, FORWARD OR REVERSE.
005506  016777  173374  173274   WRDFR:  MOV     XFRCNT,@TCWC    ;GET WORD COUNT AND SET IN TCWC
005514  017767  173270  000100           MOV     @TCWC,WRDFRG    ;2(WORD COUNT) TO WRDFRG
005522  006367  000074                   ASL     WRDFRG
005526  005477  173256                   NEG     @TCWC           ;IN 2'S COMPLEMENT FORM.
005532  067767  173254  000062           ADD     @TCBA,WRDFRG    ;2(WORD COUNT)+TCBA=FINAL TCBA CONTENTS.
005540  000000                   WRDFRA: OPEN                    ;SRCHF OR SRCHR CALL GOES HERE.
005542  012777  005600  173246           MOV     #WRDFRC,@TCVTR  ;SET INTERRUPT VECTOR TO WRDFRC.
005550  104023                           SETCOM                  ;ISSUE WDATA OR RDATA.
005552  000000                   WRDFRB: OPEN                    ;COMMAND GOES HERE.
005554  104400                           DELAY                   ;WAIT FOR INTERRUPT.
005556  104400                           DELAY
005560  104400                           DELAY
005562  104400                           DELAY
005564  104400                           DELAY
005566  104400                           DELAY
005570  104400                           DELAY
005572  104400                           DELAY
005574  104027                           NOINT                   ;FAILURE TO INTERRUPT.
005576  104000                           SCOPE
005600  022626                   WRDFRC: POPSP2                  ;HERE WHEN INTERRUPT OCCURS.
005602  022626                           POPSP2
005604  005777  173176                   TST     @TCCM           ;ERROR BIT SET?
005610  100003                           BPL     WRDFRF          ;BR IF NOT.
005612  104026                           CKERRZ                  ;CHECK FOR ERRORS.
005614  104000                           SCOPE                   ;ERROR RETURN.
005616  000240                           NOP                     ;ENOZ RETURN.
005620  104036                   WRDFRF: CKWCBA                  ;CHECK WORD COUNT AND CURRENT ADDR.
005622  000000                   WRDFRG: OPEN                    ;TCBA SHOULD EQUAL THIS.
005624  000240                   WRDFRE: NOP
005626  000002                           RTI                     ;EXIT.
005630  012767  000115  177714   WDATF:  MOV     #WDATA!FWD!IE!DO,WRDFRB
005636  016777  173246  173146           MOV     WADDR,@TCBA     ;
005644  012767  104030  177666           MOV     #SRCHF,WRDFRA   ;
005652  000715                           BR      WRDFR
005654  012767  000105  177670   RDATF:  MOV     #RDATA!FWD!IE!DO,WRDFRB
005662  016777  173224  173122           MOV     RADDR,@TCBA     ;
005670  012767  104030  177642           MOV     #SRCHF,WRDFRA
005676  000703                           BR      WRDFR
005700  012767  004115  177644   WDATR:  MOV     #WDATA!REV!IE!DO,WRDFRB
005706  016777  173176  173076           MOV     WADDR,@TCBA     ;
005714  012767  104031  177616           MOV     #SRCHR,WRDFRA   ;
005722  000671                           BR      WRDFR
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1435  005724  012767  004105  177620  RDATR:  MOV     #RDATA!REV!IE!DO,WRDFRB
1436  005732  016777  173154  173052          MOV     RADDR,@TCBA     ;
1437  005740  012767  104031  177572          MOV     #SRCHR,WRDFRA
1438  005746  000657                          BR      WRDFR
1439                          ;SUB TO REWIND AVAILABLE TRANSPORTS.
1440  005750  104002          MRWIND: SAV03
1441  005752  005067  173102                  CLR     BLKRQ
1442  005756  012700  000010                  MOV     #8.,R0          ;SET UP TO REWIND 8 TRANSPORTS.
1443  005762  005267  000010          MRWNDA: INC     MRWNDB
1444  005766  042767  177770  000002        BIC     #177770,MRWNDB
1445  005774  104046                        SELDRV                  ;SELECT TRANSPORT.
1446  005776  000000          MRWNDB: OPEN                    ;TRANSPORT NUMBER.
1447  006000  000402                  BR      MRWNDC          ;TRANSPORT NOT AVAILABLE RETURN.
1448  006002  104031                        SRCHR                   ;SEARCH FOR REVERSE BLOCK 0 ON
1449  006004  104025                        STOPDT                  ;SELECTED DRIVE, AND STOP DECTAPE.
1450  006006  005300          MRWNDC: DEC     R0              ;DONE 8 TRANSPORTS?
1451  006010  001364                  BNE     MRWNDA          ;BR IF NOT.
1452  006012  104003                        RST03
1453  006014  000207                        RTS     PC              ;DONE. EXIT.
1454                          ;SUB TO GET AVAILABLE TRANSPORTS MOVING FORWARD.
1455  006016  104002          MFWD:   SAV03
1456  006020  012700  000010                  MOV     #8.,R0          ;SET UP TO MOVE 8 TRANSPORTS.
1457  006024  005267  000010          MFWDA:  INC     MFWDB
1458  006030  042767  177770  000002        BIC     #177770,MFWDB
1459  006036  104046                        SELDRV                  ;SELECT TRANSPORT.
1460  006040  000000          MFWDB:  OPEN                    ;TRANSPORT NUMBER.
1461  006042  000402                  BR      MFWDC           ;TRANSPORT NOT AVAILABLE RETURN.
1462  006044  104023                        SETCOM                  ;ISSUE RNUM!FWD COMMAND.
1463  006046  000002                        RNUM!FWD
1464  006050  005300          MFWDC:  DEC     R0              ;DONE 8 TRANSPORTS?
1465  006052  001364                  BNE     MFWDA           ;BR IF NOT.
1466  006054  104400                        DELAY                   ;WAIT.
1467  006056  104003                        RST03
1468  006060  000207                        RTS     PC              ;EXIT.
1469          ;*****************************************************************************
1470  006062  000000          T0:     0                       ;ROUTINE NUMBER 0                       *
1471  006064  006236                  T1                      ;ADDRESS OF NEXT ROUTINE                *
1472  006066  000012                  10.                     ;TEST ITERATION COUNT                   *
1473  006070  006072                  CA                      ;SCOPE ENTRY POINT                      *
1474          ;*****************************************************************************
1475                          ;SST COMMAND TEST. CHECK THAT ISSUING SST TO A SPECIFIC TRANSPORT DOES NOT
1476                          ;RESULT IN SOME OTHER TRANSPORT STOPPING ALSO.
1477  006072  012700  000010  CA:     MOV     #8.,R0          ;SET UP TO TEST 8  TAPES.
1478  006076  004767  177646  CB:     JSR     PC,MRWIND       ;REWIND ALL TAPES.
1479  006102  004767  177710          JSR     PC,MFWD         ;GET ALL TAPES MOVING FORWARD.
1480  006106  005267  000010          INC     CC
1481  006112  042767  177770  000002        BIC     #177770,CC
1482  006120  104046                        SELDRV                  ;SELECT TRANSPORT.
1483  006122  000000          CC:     OPEN                    ;TRANSPORT NUMBER.
1484  006124  000441                  BR      CF              ;TRANSPORT NOT AVAILABLE RETURN.
1485  006126  104023                        SETCOM                  ;STOP SELECTED TRANSPORT.
1486  006130  000010                        SST
1487  006132  012701  000007                  MOV     #7,R1           ;SET UP TO CHECK OTHER 7 TRANSPORTS.
1488  006136  016767  177760  000014          MOV     CC,CD           ;MOVE # OF UNIT JUST STOPPED AND INCREMENT IT.
1489  006144  005267  000010  CDA:    INC     CD
1490  006150  042767  177770  000002        BIC     #177770,CD
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1491  006156  104046                    SELDRV                  ;SELECT TRANSPORT.
1492  006160  000000              CD:   OPEN                    ;TRANSPORT NUMBER.
1493  006162  000420                    BR      CE              ;TRANSPORT NOT AVAILABLE RETURN.
1494  006164  104023                    SETCOM                  ;SELECT TRANSPORT WITH DINH BIT SET.
1495  006166  010002                    DINH!RNUM!FWD
1496  006170  104400                    DELAY                   ;WAIT
1497  006172  032777  000200  172604    BIT     #BIT7,@TCST     ;UPS BIT SET?
1498  006200  001011                    BNE     CE              ;BR IF YES.
1499  006202  104024                    STATUS                  ;SAVE STATUS.
1500  006204  104013                    OACNV                   ;CONVERT # OF UNIT STOPPED TO ASCII.
1501  006206  006125                    CC
1502  006210  010123                    ACEMSG
1503  006212  000001                    1
1504  006214  104012                    ERRORN                  ;SST TO SPECIFIC UNIT RESULTED IN ANOTHER
1505  006216  010064                    CEMSG                   ;ALSO STOPPING.
1506  006220  007511                    STAT
1507  006222  177777                    -1
1508  006224  005301              CE:   DEC     R1              ;TESTED 7 UNITS?
1509  006226  001346                    BNE     CDA             ;BR IF NOT.
1510  006230  005300              CF:   DEC     R0              ;STOP TESTED ALL UNITS?
1511  006232  001321                    BNE     CB              ;BR IF NOT.
1512  006234  104000                    SCOPE                   ;YES. SCOPE.
1513                                    ;*****************************************************************
1514  006236  000001              T1:   1                       ;ROUTINE NUMBER 1                       *
1515  006240  006376                    T2                      ;ADDRESS OF NEXT ROUTINE                *
1516  006242  000001                    1                       ;TEST ITERATION COUNT                   *
1517  006244  006246                    AA                      ;SCOPE ENTRY POINT                      *
1518                                    *****************************************************************
1519                                    ;SELECTION TEST. WRITE EACH UNIT'S TAPE WITH THE UNIT'S NUMBER. THEN,
1520                                    ;SEQUENTIALLY READ DATA FROM EACH UNIT. DATA READ SHOULD MATCH UNIT'S NUMBER.
1521  006246  012767  000400  172632  AA:   MOV     #256.,XFRCNT    ;SET UP 256 WORD TRANSFER.
1522  006254  104050                    XFRSET
1523  006256  005067  000006                CLR     AC
1524  006262  012700  000010                MOV     #8.,R0
1525  006266  104046              AB:   SELDRV                  ;SELECT DRIVE.
1526  006270  000000              AC:   OPEN                    ;NUMBER OF DRIVE TO BE SELECTED.
1527  006272  000402                    BR      AD              ;UNIT NOT AVAILABLE RETURN
1528  006274  004767  000044            JSR     PC,AK           ;AVAILABLE. GO WRITE TAPE.
1529  006300  005267  177764        AD:   INC     AC              ;
1530  006304  005300                    DEC     R0              ;ALL UNITS AVAILABLE WRITTEN?
1531  006306  001367                    BNE     AB              ;BR IF NOT
1532  006310  012700  000024            MOV     #20.,R0         ;SET UP TO READ 20 BLOCKS.
1533  006314  012767  177777  172536    MOV     #-1,BLKRQ       ;STARTING WITH BLOCK 0.
1534  006322  005267  172532        AG:   INC     BLKRQ           ;
1535  006326  104056                    SEQDRV                  ;SELECT SEQUENTIAL TRANSPORT
1536  006330  104034                    RDATAF                  ;CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
1537                                                            ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
1538                                                            ;RADDR AND ABOVE.
1539  006332  104025                    STOPDT                  ;STOP DECTAPE.
1540  006334  104054                    DATCKS                  ;CALL DATCKS SUB TO CHECK DATA SPECIFIED BY LOC RADDR
1541                                                            ;AGAINST THE DATA WORD IN LOC UNITN.
1542  006336  005300                    DEC     R0              ;DONE 20 TIMES?
1543  006340  001370                    BNE     AG              ;BR IF NOT.
1544  006342  104000                    SCOPE                   ;DONE. SCOPE.
1545  006344  104053              AK:   DRVFIL                  ;FILL WRITE BUFFER WITH SELECTED UNIT'S NUMBER.
1546  006346  012701  000024            MOV     #20.,R1         ;SET UP TO WRITE 20 BLOCKS.
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006352  012767  177777  172500          MOV     #-1,BLKRQ       ;STARTING WITH BLOCK 0.
006360  005267  172474          AL:     INC     BLKRQ
006364  104032                          WDATAF                  ;CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
                                                                ;SET IN LOC XFRCNT, STARTING FROM ADDR SET
                                                                ;IN LOC WADDR.
006366  005301                          DEC     R1              ;20 BLOCKS WRITTEN?
006370  001373                          BNE     AL              ;BR IF NOT.
006372  104025                          STOPDT                  ;STOP DECTAPE.
006374  000207                          RTS     PC              ;EXIT.
                                ;**********************************************************************
006376  000002                  T2:     2                       ;ROUTINE NUMBER 2                    *
006400  006450                          T3                      ;ADDRESS OF NEXT ROUTINE             *
006402  000144                          100.                    ;TEST ITERATION COUNT                *
006404  006420                          DA                      ;SCOPE ENTRY POINT                   *
                                ;**********************************************************************
                                ;SEQUENTIAL UNIT,RANDOM BLOCK, 3 BLOCK TRANSFERS, FWD WRITE, REV READ.
                                ; BINARY COUNT PATTERN
006406  012767  001400  172472          MOV     #768.,XFRCNT    ;SET UP 768 WORD TRANSFER.
006414  104050                          XFRSET
006416  104051                          RNDFBK                  ;RANDOM FWD BLOCK NUMBER.
006420  016767  172436  172432  DA:     MOV     BLKRQS,BLKRQ    ;RESTORE BLKRQ CONTENTS.
006426  104040                          BINFIL                  ;BINARY FILL WRITE BUFFER.
006430  104056                          SEQDRV                  ;SELECT SEQUENTIAL TRANSPORT.
006432  104032                          WDATAF                  ;CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
                                                                ;SET IN LOC XFRCNT, STARTING FROM ADDR SET
                                                                ;IN LOC WADDR.
006434  066767  172456  172416          ADD     VRBLKN,BLKRQ    ;CHANGE BLK NUM TO READ DATA IN REV
006442  104035                          RDATAR                  ;CALL RDATAR SUB TO READ REV THE # OF WORDS
                                                                ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
                                                                ;RADDR AND ABOVE.
006444  104042                          DATCKI                  ;CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
                                                                ;WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
                                                                ;READ DATA IS CHECKED IN DESCENDING ORDER.
006446  104000                          SCOPE                   ;SCOPE.
                                ;**********************************************************************
006450  000003                  T3:     3                       ;ROUTINE NUMBER 3                    *
006452  006522                          T4                      ;ADDRESS OF NEXT ROUTINE             *
006454  000144                          100.                    ;TEST ITERATION COUNT                *
006456  006472                          EA                      ;SCOPE ENTRY POINT                   *
                                ;**********************************************************************
                                ;SEQUENTIAL UNIT,RANDOM BLOCK , 3 BLOCK TRANSFERS, REV WRITE, FWD READ.
                                ; BINARY COUNT PATTERN.
006460  012767  001400  172420          MOV     #768.,XFRCNT    ;SET 768 WORD TRANSFER.
006466  104050                          XFRSET
006470  104052                          RNDRBK                  ;RANDOM REV BLOCK NUMBER.
006472  016767  172364  172360  EA:     MOV     BLKRQS,BLKRQ    ;RESTORE BLKRQ CONTENTS.
006500  104040                          BINFIL                  ;BINARY FILL WRITE BUFFER
006502  104056                          SEQDRV                  ;SELECT SEQUENTIAL TRANSPORT.
006504  104033                          WDATAR                  ;CALL WDATAR SUB TO WRITE REV THE NUMBER OF WORDS
                                                                ;SET IN LOC XFRCNT, FROM ADDR SET IN LOC
                                                                ;WADDR AND ABOVE.
006506  166767  172404  172344          SUB     VRBLKN,BLKRQ    ;CHANGE BLK NUM TO READ DATA FWD.
006514  104034                          RDATAF                  ;CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
                                                                ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
                                                                ;RADDR AND ABOVE.
006516  104042                          DATCKI                  ;CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
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                                                              ;WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
                                                              ;READ DATA IS CHECKED IN DESCENDING ORDER
 006520  104000                            SCOPE              ;SCOPE
                                    ;*******************************************************************
 006522  000004                     T4:    4                  ;ROUTINE NUMBER 4                       *
 006524  006574                            T5                 ;ADDRESS OF NEXT ROUTINE                *
 006526  000144                            100.               ;TEST ITERATION COUNT                   *
 006530  006544                            FA                 ;SCOPE ENTRY POINT                      *
                                    ;*******************************************************************
                                    ;SEQUENTIAL UNIT, RANDOM BLOCK, 3 BLOCK TRANSFERS, FWD WRITE, REV READ.
                                    ; RANDOM DATA.
 006532  012767  001400  172346            MOV     #768.,XFRCNT     ;SET UP 768 WORD TRANSFER.
 006540  104050                            XFRSET
 006542  104051                            RNDFBK                   ;RANDOM FWD BLOCK NUMBER.
 006544  016767  172312  172306     FA:    MOV     BLKRQS,BLKRQ     ;RESTORE BLKRQ CONTENTS.
 006552  104055                            RNDFIL                   ;RANDOM FILL WRITE BUFFER.
 006554  104056                            SEQDRV                   ;SELECT SEQUENTIAL TRANSPORT.
 006556  104032                            WDATAF                   ;CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
                                                                    ;SET IN LOC XFRCNT, STARTING FROM ADDR SET
                                                                    ;IN LOC WADDR.
 006560  066767  172332  172272            ADD     VRBLKN,BLKRQ     ;CHANGE BLK NUM TO READ IN REV.
 006566  104035                            RDATAR                   ;CALL RDATAR SUB TO READ REV THE # OF WORDS
                                                                    ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
                                                                    ;RADDR AND ABOVE.
 006570  104042                            DATCKI                   ;CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
                                                                    ;WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
                                                                    ;READ DATA IS CHECKED IN DESCENDING ORDER.
 006572  104000                            SCOPE
                                    ;*******************************************************************
 006574  000005                     T5:    5                  ;ROUTINE NUMBER 5                       *
 006576  006646                            T6                 ;ADDRESS OF NEXT ROUTINE                *
 006600  000144                            100.               ;TEST ITERATION COUNT                   *
 006602  006616                            GA                 ;SCOPE ENTRY POINT                      *
                                    ;*******************************************************************
                                    ;SEQUENTIAL UNIT, RANDOM BLOCK, 3 BLOCK TRANSFERS, REV WRITE, FWD READ.
                                    ; RANDOM DATA.
 006604  012767  001400  172274            MOV     #768.,XFRCNT     ;SET UP 768 WORD TRANSFER.
 006612  104050                            XFRSET
 006614  104052                            RNDRBK                   ;RANDOM REV BLOCK NUMBER.
 006616  016767  172240  172234     GA:    MOV     BLKRQS,BLKRQ     ;RESTORE BLKRQ CONTENTS.
 006624  104055                            RNDFIL                   ;RANDOM FILL WRITE BUFFER.
 006626  104056                            SEQDRV                   ;SELECT SEQUENTIAL TRANSPORT.
 006630  104033                            WDATAR                   ;CALL WDATAR SUB TO WRITE REV THE NUMBER OF WORDS
                                                                    ;SET IN LOC XFRCNT, FROM ADDR SET IN LOC
                                                                    ;WADDR AND ABOVE.
 006632  166767  172260  172220            SUB     VRBLKN,BLKRQ     ;CHANGE BLK NUM TO READ FWD.
 006640  104034                            RDATAF                   ;CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
                                                                    ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
                                                                    ;RADDR AND ABOVE.
 006642  104042                            DATCKI                   ;CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
                                                                    ;WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
                                                                    ;READ DATA IS CHECKED IN DESCENDING ORDER.
 006644  104000                            SCOPE                    ;SCOPE.
                                    ;*******************************************************************
 006646  000006                     T6:    6                  ;ROUTINE NUMBER 6                       *
 006650  006724                            T7                 ;ADDRESS OF NEXT ROUTINE                *
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                        250.                    ;TEST ITERATION COUNT                   *
                        HA                      ;SCOPE ENTRY POINT                      *
                ;*****************************************************************************
                ;RANDOM UNIT, RANDOM LENGTH TRANSFERS, FWD WRITE, REV READ. RANDOM DATA.
                ;ALL FWD WRITE TRANSFERS START AT BLOCK 0.
                        MOV     BFSIZE,XFRCNT
                        XFRSET
                        RNDFIL                  ;RANDOM FILL WRITE BUFFER.
                        CLR     BLKRQS          ;TRANSFERS START AT BLOCK 0.
                HA:     RNDXFR                  ;RANDOM TRANSFER COUNT.
                        MOV     BLKRQS,BLKRQ    ;RESTORE BLKRQ CONTENTS.
                        RNDRIV                  ;RANDOM TRANSPORT.
                        WDATAF                  ;CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
                                                ;SET IN LOC XFRCNT, STARTING FROM ADDR SET
                                                ;IN LOC WADDR.
                        ADD     VRBLKN,BLKRQ    ;CHANGE BLK NUM TO READ REV.
                        RDATAR                  ;CALL RDATAR SUB TO READ REV THE # OF WORDS
                                                ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
                                                ;RADDR AND ABOVE.
                        DATCKI                  ;CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
                                                ;WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2.XFRCNT.-2
                                                ;READ DATA IS CHECKED IN DESCENDING ORDER.
                        SCOPE                   ;SCOPE
                ;*****************************************************************************
                17:     7                       ;ROUTINE NUMBER 7                       *
                        TLAST                   ;ADDRESS OF NEXT ROUTINE                *
                        250.                    ;TEST ITERATION COUNT                   *
                        IA                      ;SCOPE ENTRY POINT                      *
                ;*****************************************************************************
                ;RANDOM UNIT, RANDOM LENGTH TRANSFERS, REV WRITE, FWD READ. RANDOM DATA.
                ;ALL REV WRITE TRANSFERS START AT BLOCK 1101
                        MOV     BFSIZE,XFRCNT
                        XFRSET
                        RNDFIL                  ;RANDOM FILL WRITE BUFFER.
                        MOV     #1101,BLKRQS    ;TRANSFERS START AT BLOCK 1101
                IA:     RNDXFR                  ;RANDOM TRANSFER COUNT.
                        MOV     BLKRQS,BLKRQ    ;RESTORE BLKRQ CONTENTS.
                        RNDRIV                  ;RANDOM TRANSPORT.
                        WDATAR                  ;CALL WDATAR SUB TO WRITE REV THE NUMBER OF WORDS
                                                ;SET IN LOC XFRCNT, FROM ADDR SET IN LOC
                                                ;WADDR AND ABOVE.
                        SUB     VRBLKN,BLKRQ    ;CHANGE BLK NUM TO READ FWD.
                        RDATAF                  ;CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
                                                ;SET IN LOC XFRCNT, INTO ADDR SET IN LOC
                                                ;RADDR AND ABOVE.
                        DATCKI                  ;CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
                                                ;WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2.XFRCNT.-2
                                                ;READ DATA IS CHECKED IN DESCENDING ORDER.
                        SCOPE                   ;SCOPE.
                EMO:    .ASCII  '%.T '
                ATNUMB: .ASCII  '     PC '
                APC:    .ASCII  '         ICNT '
                AICNT:  .ASCII  '      .'
```

```
1715  007042      056
1716  007043      040  047125  052111          .ASCII  ' UNIT '
1717  007050      040
1718  007051      040     040          AUNIT:  .ASCII  '  '
1719  007053      045  043130  041522          .ASCII  '%XFRCNT '
1720  007060  052116      040
1721  007063      040  020040  020040  AXFCNT: .ASCII  '        WADDR '
1722  007070  020040  053440  042101
1723  007076  051104      040
1724  007101      040  020040  020040  AWADDR: .ASCII  '        RADDR '
1725  007106  020040  051040  042101
1726  007114  051104      040
1727  007117      040  020040  020040  ARADDR: .ASCIZ  '      '
1728  007125  000040
1729  007126  022445  047111  040526  AINCRT: .ASCIZ  '%%INVALID TEST'
1730  007134  044514  020104  042524
1731  007142  052123      000
1732  007145      045  052045  032503  PGTIT:  .ASCIZ  '%%TCS - TC11 TEST 5%%'
1733  007152  026440  052040  030503
1734  007160  020061  042524  052123
1735  007166  032440  022445      000
1736  007173      045  052123  047101  INSTI:  .ASCII  '%STANDARD TAPES ON UNITS'
1737  007200  040504  042122  052040
1738  007206  050101  051505  047440
1739  007214  020116  047125  052111
1740  007222      123
1741  007223      045  042522  047515          .ASCII  '%REMOTE, WRITE ENABLE'
1742  007230  042524  020054  051127
1743  007236  052111  020105  047105
1744  007244  041101  042514
1745  007250  053445  046101  051514          .ASCII  '%WALLSW: OFF, WRTMSW: OFF'
1746  007256  035127  047440  043106
1747  007264  020054  051127  046524
1748  007272  053523  020072  043117
1749  007300      106
1750  007301      045  042523  042514          .ASCII  '.SELECT UNITS WITH SR7 - SR0. '
1751  007306  052103  052440  044516
1752  007314  051524  053440  052111
1753  007322  020110  051123  020067
1754  007330  020055  051123  027060
1755  007336      040
1756  007337      120  042522  051523          .ASCIZ  'PRESS CONT%'
1757  007344  041440  047117  022524
1758  007352      000
1759  007353      045  042523  020124  ASETSR: .ASCIZ  '%SET SR OPTIONS. NORMAL SR=0'
1760  007360  051123  047440  052120
1761  007366  047511  051516  020056
1762  007374  047516  046522  046101
1763  007402  051440  036522  000060
1764  007410  044045  043511  042510  HADRM:  .ASCII  '%HIGHEST LOC FOR TRANSFERS: '
1765  007416  052123  046040  041517
1766  007424  043040  051117  052040
1767  007432  040522  051516  042506
1768  007440  051522  020072
1769  007444  020040  020040  020040  ACR_IM: .ASCIZ  '      '
1770  007452      000
```

```
1771  007453  007              APGEND: .BYTE  007
1772  007454  025045  000              .ASCIZ  %%.
1773  007457  040  041524  041527  CTCWC:  .ASCII  ' TCWC '
1774  007464  040
1775  007465  040  020040  020040  ATCWC:  .ASCIZ  '      '
1776  007472  000040
1777  007474  052040  041103  020101  CTCBA:  .ASCII  ' TCBA '
1778  007502  020040  020040  020040  ATCBA:  .ASCIZ  '      '
1779  007510  000
1780  007511  040  041524  046503  STAT:   .ASCII  ' TCCM '
1781  007516  040
1782  007517  040  020040  020040  ATCCM:  .ASCII  '       TCST '
1783  007524  020040  041524  052123
1784  007532  040
1785  007533  040  020040  020040  ATCST:  .ASCIZ  '      '
1786  007540  000040
1787  007542  047040  020117  052104  INTFAI: .ASCIZ  ' NO DT INTRPT '
1788  007550  044440  052116  050122
1789  007556  020124  000
1790
1791  007561  040  052104  042440  DTERR:  .ASCIZ  ' DT ERR '
1792  007566  051122  000040
1793  007572  041040  045514  050522  BLKSB:  .ASCII  ' BLKRQ '
1794  007600  040
1795  007601  040  020040  020040  ABLKRQ: .ASCIZ  '      '
1796  007606  000040
1797  007610  041524  041527  047040  WCNOTO: .ASCIZ  'TCWC NOT 0 '
1798  007616  052117  030040  000040
1799  007624  041524  040502  053440  INCTCB: .ASCIZ  'TCBA WRONG '
1800  007632  047522  043516  000040
1801  007640  052040  041103  020101  TCBASB: .ASCII  ' TCBA '
1802  007646  020040  020040  020040  ATCBAS: .ASCIZ  '      '
1803  007654  020040  000
1804  007657  040  040504  040524  DATERR: .ASCII  ' DATA ERR  WORD '
1805  007664  042440  051122  020040
1806  007672  047527  042122  040
1807  007677  040  020040  027040  AWDCNT: .ASCII  '    .  S/B '
1808  007704  020040  027523  020102
1809  007712  020040  020040  020040  ADATSB: .ASCII  '       WAS '
1810  007720  020040  040527  020123
1811  007726  020040  020040  020040  ADATWS: .ASCIZ  '      '
1812  007734  000
1813  007735  122  054504  042457  STCMSG: .ASCIZ  'RDY/ERR NOT 0 AFTER DO'
1814  007742  051122  047040  052117
1815  007750  030040  040440  052106
1816  007756  051105  042040  000117
1817  007764  041040  045514  047040  SRCHER: .ASCIZ  ' BLK NOT FOUND'
1818  007772  052117  043040  052517
1819  010000  042116  000
1820  010003  040  043040  041520  FPCMSG: .ASCII  '  FPC '
1821  010010  040
1822  010011  040  020040  020040  AFPC:   .ASCIZ  '      %'
1823  010016  020040  000045
1824  010022  052445  051520  041040  BEMSG:  .ASCIZ  '%UPS BIT NOT SET WITHIN 20 MSECS.'
1825  010030  052111  047040  052117
1826  010036  051440  052105  05344C
```

```
1827  010044  052111  044510  020116
1828  010052  030062  046340  042523
1829  010060  051503  000056
1830  010064  052445  044516  020124  CEMSG:  .ASCII  '%UNIT STOPPED WITH SST TO UNIT '
1831  010072  052123  050117  042520
1832  010100  020104  044527  044124
1833  010106  051440  052123  052040
1834  010114  020117  047125  052111
1835  010122      040
1836  010123      040      000          ACEMSG: .ASCIZ  ' '
1837  010125      045  047516  052440  NOUNIT: .ASCIZ  '%NO UNITS AVAILABLE.'
1838  010132  044516  051524  040440
1839  010140  040526  046111  041101
1840  010146  042514  000056
1841  010152  053445  046111  020114  GOOD:   .ASCIZ  '%WILL TEST UNITS: '
1842  010160  042524  052123  052440
1843  010166  044516  051524  020072
1844  010174      000
1845  010175      040  000054          GTAPES: .ASCIZ  ' ,'
1846  010200      060      061      062  GTAB:   .BYTE   '0,'1,'2,'3,'4,'5,'6,'7
1847  010203      063      064      065
1848  010206      066      067
1849                                     .EVEN
1850  010210  000000                  CODEND: OPEN
1851          000001                          .END
```

```
A       = 100000            459#
AA        006246           1517    1521#
AB        006266           1525#   1531
ABLKRQ    007601            850    1795#
AC        006270           1523*   1526#   1529#
ACEMSG    010123           1502    1836#
ACRLIM    007444           1035    1769#
ACTDAT    004554           1223#   1245*   1246    1257
AD        006300           1527    1529#
ADATSB    007712           1254    1809#
ADATWS    007726           1258    1811#
AFPC      010011            827    1822#
AG        006322           1534#   1543
AICNT     007035            842    1714#
AINCRT    007126            686    1729#
AK        006344           1528    1545#
AL        006360           1548#   1553
APC       007020            834    1711#
APGENO    007453            710    1771#
ARADDR    007117            878    1727#
ASETSR    007353            663    1759#
ATCBA     007502            866    1778#
ATCBAS    007646           1311    1802#
ATCCM     007517            858    1782#
ATCST     007533            854    1785#
ATCWC     007465            862    1775#
ATNUMB    007010            838    1709#
AUNIT     007051            846    1718#
AWADDR    007101            874    1724#
AWDCNT    007677           1250    1807#
AXFCNT    007063            870    1721#
B       = 040000            460#
BDCNV   = 104014            560#    840    1248
BDCNVA    003332            986#    996
BDCNVB    003334            987#    990
BDCNVC    003344            988     991#
BDCNVD    003370           1000#   1002
BDCNVV    003312            559     981#
BELL    = 000007            454#
BEMSG     010022           1824#
BFSIZE    001104            539#   1029*   1104    1664    1690
BINFIL  = 104040            580#   1568    1593
BINFLA    005040           1286#   1290
BINFLB    005042           12..?#  1288
BINFLL    005026            579    1283#
BIT0    = 000001            432#    491    1028    1095    1177
BIT1    = 000002            431#    484     486     488     490    1095
BIT10   = 002000            422#    478     479     480     481     701
BIT11   = 004000            421#    472     494     637     697    1354    1360    1366    1374    1376    1378
BIT12   = 010000            420#    471     493     637
BIT13   = 020000            419#    461     470     881
BIT14   = 040000            418#    460     694
BIT15   = 100000            416     417#    459     625    1175
BIT2    = 000004            430#    485     486     489     490    1095
BIT3    = 000010            429#    487     488     489     490    1095
BIT4    = 000020            428#   1095
```

```
BIT5   = 000040   427#  1095
BIT6   = 000100   426#  482   1095
BIT7   = 000200   425#  492   625   1095  1175  1497
BIT8   = 000400   424#  475   477   479   481
BIT9   = 001000   423#  476   477   480   481   676   705
BLKRQ    001060   529#  849   1139# 1140  1149# 1150  1351  1357  1363  1441# 1533# 1534# 1547#
                  1548# 1567# 1573# 1592# 1598# 1617# 1623# 1642# 1648# 1669# 1674# 1695# 1700#
BLKRQS   001062   530#  1140# 1150# 1567  1592  1617  1642  1667# 1669  1693# 1695
BLKSB    007572   1262  1385  1793#
BMOVA    003300   975#  977
BMOVE  = 104017   563#
BMOVV    003270   562   971#
C      = 020000   461#
CA       006072   1473  1477#
CB       006076   1478# 1511
CC       006122   1480# 1481# 1483# 1488  1501
CD       006160   1488# 1489# 1490# 1492#
CDA      006144   1489# 1509
CE       006224   1493  1498  1508#
CEMSG    010064   1505  1830#
CF       006230   1484  1510#
CHAINN   001730   547   689#
CHALT  = 104020   564#  659   664   687
CHLT     002460   563   813#
CHNA     001764   695   697#
CHNAA    002002   698   701#
CHNAB    001760   696#  700
CHNAC    001750   692   694#
CHNB     002020   702   705#
CHNC     002044   636   711#  717
CKERRZ= 104026   570#  1348  1416
CKERZ    004460   569   1193#
CKERZA   004472   1197# 1201
CKERZB   004474   1198# 1208
CKERZC   004500   1195  1200#
CKERZD   004506   1202#
CKWCBA= 104036   578#  1419
CLEAR  = 104037   579#
CLEARR   005006   578   1274#
CODEND   010210   620   1025  1031  1850#
COMND    001072   534#  1171# 1172# 1173# 1174  1177
CORSTA   003460   1019  1021# 1040
CORSTB   003552   1013  1040#
CORSTD   003476   1024#
CORSTF   003454   1015  1017  1020#
CORSTP   003422   599   1013#
CPENA    001520   644#  647#  653#  655
CPENB    001542   648   653#
CTCBA    007474   1304  1317  1777#
CTCWC    007457   1303  1318  1773#
CTRA     001044   523#  645#  654#
CURTST   001042   522#  678   724#
CWCBA    005060   577   1295#
CWCBB    005114   1299  1307#
CWCBC    005154   1308  1321#
DA       006420   1560  1567#
```

```
DATCHK= 104041   581#
DATCK   004616   580    1231#
DATCKA  004664  1237    1241#
DATCKB  004702  1244#   1270
DATCKC  004712  1246#
DATCKD  004770  1247    1267#
DATCKE  004774  1225*   1228*   1231*   1268#
DATCKG  004776  1269#
DATCKH  005002  1266    1271#
DATCKI= 104042   582#   1577    1602    1627    1652    1678    1704
DATCKK  004630  1227    1230    1233#
DATCKS= 104054   592#   1540
DATERR  007657  1263    1804#
DATIND  004546  1220#   1226*   1229*   1232*   1236
DATKNT  004550  1221#   1242*   1249    1267*
DECVAL  003414   983    1010#
DELAY = 104400   498#   1338    1339    1340    1402    1403    1404    1405    1406    1407    1408    1409    1466
                1496
DINH  = 010000   471#   1495
DIRIND  005505  1325*   1327*   1368    1371    1391#
DLY     003070   407     924     926#
DLYA    003076   925     927*    931
DLYB    003104   928#    929
DLYRO = 003074   924#    930*
DLYR1 = 003102   925#    928*
DO    = 000001   491#    623     1335    1423    1427    1431    1435
DRVFIL= 104053   591#   1545
DRVFLA  004154  1129#   1131
DRVFLL  004136   590    1125#
DTCKI   004600   581    1228#
DTCKSS  004556   591    1224#
DTERR   007561  1205    1791#
DTRMN   001326   608#    631
DTRMNA  001430   612     629#    638     641
DTRMNB  001452   615     619     624     628     637#
DTRMNC  001476   633     642#
EA      006472  1585    1592#
EHALT = 104021   565#    888
EHLT    002472   564     819#
EHLTA   002502   820     822#
EMTINT  002142   405     729#
EMTTAB  001122   546#    733
EMTV    000030   405#
EMTX  = 000057   495#    548#    549#    550#    551#    552#    553#    554#    555#    556#    557#    558#    559#
                560#    561#    562#    563#    564#    565#    566#    567#    568#    569#    570#    571#    572#
                573#    574#    575#    576#    577#    578#    579#    580#    581#    582#    583#    584#    585#
                586#    587#    588#    589#    590#    591#    592#    593#    594#
EMO     007004   880    1708#
ERRB    002716   830*    831*    833     880*    884#    885*    886
ERRLIM  001120   545#   1243
ERRN    002504   547     823#
ERRNA   002704   881#    887
ERRNB   002720   882     885#
ERRNC   002734   888#
ERRND   002712   605#    665*    882#
ERRORN= 104012   558#   1181    1203    1212    1260    1300    1313    1383    1504
```

```
EXPDAT  004552  1222#  1244#  1246  1253
FA      006544  1610   1617#
FORMD   002074   675    719#
FORMDA  002120   724#
FPC     001076   536#   824#  826
FPCMSG  010003  1182#  1204   1213  1261  1301  1314  1384  1820#
FWD   = 000000   473#   623   1423  1427  1463  1495
GA      006616  1635   1642#
GETBN1= 104044   584#  1286
GETRDY  001602   506    656   665*  688   706   718
GOOD    010152   643   1841#
GORUN   001666   678#   682
GTAB    010200   650   1846#
GTAPES  010175   650#   652   1845#
GTBIN1  003154   583    942#
GTRDYA  001652   675#   684
GTRDYB  001656   676#
GTRDYC  001672   677    679#
GTRDYD  001710   683#
GTRDYX  001616   667#   708
HA      006674  1660   1668#
HADRM   007410  1038   1764#
HERE    002072   712    718#
I     = 000040   457#
IA      006754  1686   1694#
ICNT    001030   517#   691*  693*  725*  841
ICTR    001026   516#   699*  722*
IE    = 000100   482#  1335   1423  1427  1431  1435
ILC   = 010000   493#
INBIN = 104043   583#   600
INBINN  003122   582    934#
INCTCB  007624  1315   1799#
INRMC = 104016   562#   601
INRMON  003636   561   1061#
INSTI   007173   658   1736#
INTFAI  007542  1214   1787#
IOTV    000020   401#
KSTART  001032   518#   666
LOGIC   002054   500    714#  1016
MACHER  000004   395#  1013*  1023*
MAINT = 020000   470#
MANUAL= 100000   416#
MFMD    006016  1455#  1479
MFMDA   006024  1457#  1465
MFMDB   006040  1457*  1458*  1460#
MFMDC   006050  1461   1464#
MPWIND  005750  1440#  1478
MRWNDA  005762  1443#  1451
MRWNDB  005776  1443*  1444*  1446#
MRWNDC  006006  1447   1450#
NOINT = 104027   571#  1341   1410
NOINTR  004524   570   1210#
NOP   = 000240   414#   715    741
NOUNIT  010125   635   1837#
NXTST   00104C   521#   666*  683   707   719   721*
OACN. = 104013   559#   825   832   836   844   848   852   856   860   864   869   87?   87E
```

```
                    1033    1252    1256    1309    1500
DACNVA  003232       958#    967
DACNVV  003220       558     953#
OPEN  = 000000       515#    516     517     519     520     521     522     523     524     525     526     527     528
                     529     530     531     532     533     534     535     536     537     538     539     540     541
                     542     543     544     611     647     884     921     938     939     940    1068    1074    1078
                    1100    1136    1144    1157    1220    1221    1222    1223    1268    1287    1390    1391    1398
                    1401    1420    1446    1460    1483    1492    1526    1850
PGTIT   007145       598    1732#
POPSP  = 005426      444#
POPSP2= 022626       445#    760     771     791    1345    1412    1413
PRTY0  = 000000      408     453#
PRTY1  = 000040      452#
PRTY2  = 000100      451#
PRTY3  = 000140      450#
PRTY4  = 000200      449#
PRTY5  = 000240      448#
PRTY6  = 000300      447#    513
PRTY7  = 000340      400     402     406     446#    667
PSW    = 177776      412#    667#
P*0     003150       935#    939#    942     947#
P*1     003152       936#    940#    942#    943#    946#    947     949
PUSH   = 005746      442#
PUSH2  = 024646      443#    753     785
RADDR   001112       542#    674#    877    1114#   1115#   1116#   1235    1428    1436
RALL   = 000006      486#
RBFLIM  001100       537#   1024#   1034    1114
RDATA  = 000004      485#   1427    1435
RDATAF= 104034       576#   1536    1599    1649    1701
RDATAR= 104035       577#   1574    1624    1675
RDATF   005654       575    1427#
RDATR   005724       576    1435#
RDFBBA  004170      1136#   1137    1139
RDRBBA  004222      1144#   1145    1147    1149
REV    = 004000       472#    614    1330    1331    1333    1431    1435
REVCNT  005504      1329#   1379#   1390#
RINC    003146       934#    935     936     938#    944#
RNOFBB  004166       588    1135#   1138
RNOFBK= 104051       589#   1566    1616
RNOFIL= 104055       593#   1618    1643    1666    1692
RNOFLA  004274      1156#   1160
RNOFLB  004276      1157#   1158
RNOFLL  004262       592    1153#
RNONUM= 104015       561#   1073    1099    1135    1143    1156
RNORBB  004220       589    1143#   1146    1148
RNORBK= 104052       590#   1591    1641
RNORIV= 104045       585#   1670    1696
RNORVA  003700      1074#   1075#   1076
RNORVB  003720      1076#   1078#
RNORVV  003676       584    1073#   1079
RNOXFA  003772      1100#   1101#   1102    1104    1106
RNOXFF  003770       586    1099#   1103    1105
RNOXFR= 104047       587#   1668    1694
RNGEN   003560       560    1043#
RNUM   = 000002       484#    614    1335    1463    1495
RP:     003632      1044    1048#   1055    1058#   1061#
```

```
RP2      003634  1047    1051    1054*   1059*   1062*
RSTO3  = 104003   551*   1452    1467
RSTO5  = 104005   552*
RSTO5S = 104007   553*
                  555*    802     816     898     968     978    1003    1056    1093    1132    1161    1271    1280
                 1291
RSTSS  = 000004   497*    889     918     950    1198    1217    1321
RX03     002562   550     760*
RX05     002312   551     771*
RX05S    002306   554     769*
RXSS     002372   401     790*
RTNNO    001036   520*    681     703     720*    726     837
SAT    = 000000   483*
SAV03  = 104002   550*   1440    1455
SAV05  = 104004   552*
SAV05S = 104006   554*    798     813     892     953     971     981    1043    1086    1125    1153    1233    1274
                 1283
SAVSS  = 000003   496*    829     914     948    1179    1193    1210    1295    1382
SCOPE  = 104000   548*   1186    1306    1320    1342    1349    1389    1411    1417    1512    1544    1580    1605
                 1630    1655    1681    1707
SCOPTR   001034   519*    696     723*
SELDRA   003754  1089    1093*
SELDRR   003726   585     1086*
SELDRV= 104046   586*    610     646    1067    1077    1445    1459    1482    1491    1525
SELE   = 004000   494*
SEQDRV= 104056   594*   1535    1569    1594    1619    1644
SETCOM= 104023   567*    613     622    1334    1400    1462    1485    1494
SPBOT  = 001000   413*    596     668     690
SQDRV    003654   593    1065*   1069
SQDRVA   003670  1065*   1066*   1068*
SQDRVI   001342   608*    609*    611*    639
SR     = 177570   411*    660     676     679     694     697     701     705     726*    819     881
SRCCON   005242  1337*   1355    1359    1361    1365    1369    1372    1380
SRCF     005376  1352    1366*
SRCHA    005174  1326    1328*
SRCHAA   005234  1332    1334*
SRCHB    005246  1336    1338*
SRCHC    005260  1328    1343*
SRCHD    005266  1343    1345*
SRCHDA   005304  1347    1351*
SRCHE    005346  1353    1360*
SRCHER   007764  1386    1817*
SRCHF  = 104030   572*    1425    1429
SRCHFF   005160   571     1325*
SRCHG    005416  1367    1371*
SRCHM    005236  1330*   1333*   1335*
SRCHR  = 104031   573*    1433    1437    1448
SRCHRR   005166   572     1327*
SRCREV   005426  1350    1374*
SRCRVA   005436  1358    1376*
SRCRVB   005446  1364    1375    1378*
SRCRVC   005454  1377    1379*
SRESET= 104001   549*     669
SRSETT   002436   548     805*    808*
SST    = 000010   487*    1486
STARTT   001260   504     596*
STATT    007511  1184    1206    1215    1387    1506    1780*
```

```
STATS   004314            567    1164#
STATUS= 104024            568#   1180    1202    1211    1297    1381    1499
STCMSG  007735           1183    1813#
STCOM   004354            566    1171#
STCOMB  004442           1176    1178    1187#
STOPDT= 104025            569#    629     689     823    1449    1539    1554
STPDT   004450            568    1190#
STRTA   001556            603     657#    661
STTCV   002416            565     798#
SVECTR= 104022            566#    670
SV03    002162            549     736#
SV05    002212            551     744#
SV05A   002220            542     745#
SV05B   002234            739     749#
SV05C   002246            738#    741#    744#    754#
SV05S   002202            553     741#
SVSS    002342            399     781#
TCBA    001012            510#    620#    1168    1307    1397    1424#   1428#   1432#   1436#
TCBASB  007640           1316    1801#
TCBAT   001056            528#    865     1168#
TCCM    001006            508#    616     625     627     1165    1174#   1175    1190#   1194    1331    1337#   1346    1354
                         1360    1366    1374    1376#   1378#   1414
TCCMT   001046            524#    857     1165#
TCDT    001014            511#   1167     1351    1356#   1357    1362#   1363
TCDTT   001052            526#   1167#
TCLVL   001020            513#    801
TCST    001004            507#    618     637     1164    1200    1497
TCSTT   001050            525#    853     1164#
TCVTR   001016            512#    799     1328#   1399#
TCWC    001010            509#    621#    1166    1298    1393#   1394    1396#
TCWCT   001054            527#    861     1166#
TEMP    001074            535#   1296#    1307    1310
TEMPWR  003402            984    1005#
TLAST = 177777            455#   1684
TPB     001024            515#    904#
TPS     001022            514#    905
TRC   = 000003            456#
TRCV    000014            399#
TRPV    000034            407#
TYP     002742            555     892#
TYPA    002746            894#    903     912
TYPC    002766            895     900#
TYPD    003002            897     902     904#    909     911
TYPE  = 104010            556#    597     634     642     651     657     662     685     709     883     920     1037
TYPES = 104011            557#
TYPF    003016            901     905#
TYPG    003026            910#
TYPS    003040            556     914#    922
TYPSA   003062            917     920#
TYPSB   003064            915#    916     921#
T0      006062            518    1470#
T1      006236           1471    1514#
T2      006376           1515    1557#
T3      006450           1558    1582#
T4      006522           1583    1607#
T5      006574           1608    1632#
```

```
I6          006646          1633    1657*
            006724          1658    1683*
UNIT        001064           531*   1091*   1172
UNITN       001066           532*    649     845   1090*   1127   1224
UNITS       001070           533*    606*    632    640*    660*    716   1088
UNTAB       003760           640    1088    1095*
UPS     =   000200           492*
U0      =   000000           474*
U1      =   000400           475*
U2      =   001000           476*
U3      =   001400           477*
U4      =   002000           478*
U5      =   002400           479*
U6      =   003000           480*
U7      =   003400           481*
VFBLKN      001114           543*   1120*   1121*   1137
VRBLKN      001116           544*   1117*   1118*   1119*   1121   1122*   1145   1573   1598   1623   1648   1674   1700
V0      =   000000           462*
V1      =   000004           463*
V2      =   000010           464*
V3      =   000014           465*
V4      =   000020           466*
V5      =   000024           467*
V6      =   000030           468*
V7      =   000034           469*
WADDR       001110           541*    673*    873   1111*   1112*   1113*   1126   1154   1224*   1234   1284   1424   1432
WALL    =   000016           490*
WBFLIM      001102           538*   1032*   1111
WCNOTO      007610          1302    1797*
WDATA   =   000014           489*    623    1423   1431
WDATAF  =   104032           574*   1549    1570   1620   1671
WDATAR  =   104033           575*   1595    1645   1697
WDATF       005630           573    1423*
WDATR       005700           574    1431*
WRDFR       005506          1393*   1426    1430   1434   1438
WRDFRA      005540          1398*   1425*   1429*   1433*   1437*
WRDFRB      005552          1401*   1423*   1427*   1431*   1435*
WRDFRC      005600          1399    1412*
WRDFRE      005624          1421*
WRDFRF      005620          1415    1419*
WRDFRG      005622          1394*   1395*   1397*   1420*
WRTM    =   000012           488*
X       =   000007           458*   1469    1474*   1513   1518*   1556   1561*   1581   1586*   1606   1611*   1631   1636*
                            1655   1661*   1682    1687*
XFRCNT      001106           540*    672*    869   1106*   1112   1113   1115   1116   1117   1128   1155   1238   1239
                            1241   1285    1393   1521*   1564*   1589*   1614*   1639*   1664*   1690*
XFRSET=     104050           588*   1107    1522   1565    1590   1615   1640   1665   1691
XFRSTT      004032           587    1111*
.       =   010212           392*    393     395    397     403    410    499*   501*   503*   505*   617    626    906
                             945   1279
```

```
CKDI      392#
CKDTI     392#  1577  1602  1627  1652  1678  1704
CKDTS     392#  1540
EMTDEF    392#   547   548   549   550   551   552   553   554   555   556   557   558   559   560
           561   562   563   564   565   566   567   568   569   570   571   572   573   574   575
           576   577   578   579   580   581   582   583   584   585   586   587   588   589   590
           591   592   593
RDTF      392#  1536  1599  1649  1701
RDTR      392#  1574  1624  1675
TSTA      392#  1469  1513  1556  1581  1606  1631  1656
TSTAA     392#  1469  1513  1556  1581  1606  1631  1656  1682
WDTF      392#  1549  1570  1620  1671
WDTR      392#  1595  1645  1697

. ABS.  010212     000

 ERRORS DETECTED:  0

 DZTCED,DZTCED CRF/SOL DOC=DZTCED.P11
 RUN-TIME:  2  4  .8 SECONDS
 RUN-TIME RATIO: 71.7=9.9
 CORE USED:  9K  (17 PAGES)

 DOCUMENT PAGES:  45
```